SOVIET GEOGRAPHY:

REVIEW & TRANSLATION

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Soviet Geography: Review and Translation

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This translation and publication project was undertaken by the American Geographical Society in the conviction that the dissemination of the fruits of Soviet geographic research would be a service to American geographers and would help bring about professional contacts between geographers of the two countries. The National Science Foundation encouraged the project and is supporting it by a grant.

Readers are invited to send in their comments and discussion of articles published in Soviet Geography. Readers are also encouraged to submit suggestions as to published Soviet geographic literature worthy of translation. Such suggestions should relate to articles of general substantive or methodological interest rather than materials of narrow, specialized appeal.

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The American Geographical Society takes pleasure in sending you an introductory copy of the first issue of this journal, designed to acquaint American geographers with the work of their Soviet colleagues. Although the journal will appear monthly with an average of 80 pages, its first issue has been given a bimonthly heading for bibliographical reasons. The material in this issue was translated under contract Nonr-289 2(00) with the Geography Branch, Office of Naval Research, prior to the granting of financial support by the National Science Foundation. A subscription coupon will be found on Page 79.

TRANSLITERATION TABLE

Russian			English	Russian			English
А	а	*а*	a	Р	р	*р*	r
Б	б	*б*	b	С	с	*с*	s
В	в	*в*	v	Т	т	*т*	t
Г	г	*г*	g	У	у	*у*	u
Д	д	*д*	d	Ф	ф	*ф*	f
Е	е	*е*	e*	Х	х	*х*	kh
Ж	ж	*ж*	zh	Ц	ц	*ц*	ts
З	з	*з*	z	Ч	ч	*ч*	ch
И	и	*и*	i	Ш	ш	*ш*	sh
Й	й	*й*	y	Щ	щ	*щ*	shch
К	к	*к*	k	Ъ	ъ	*ъ*	”
Л	л	*л*	l	Ы	ы	*ы*	y
М	м	*м*	m	Ь	ь	*ь*	’
Н	н	*н*	n	Э	э	*э*	e
О	о	*о*	o	Ю	ю	*ю*	yu
П	п	*п*	p	Я	я	*я*	ya

(*) Instead of e, use ye at the beginning of names, after vowels and after the soft sign (').

The transliteration table is supplied for the general information of readers and to enable them to identify the geographic names on maps that will be reproduced from time to time in SOVIET GEOGRAPHY.

The transliteration system is the one proposed by the United States Board on Geographic Names. For more general use in textbooks and other popular needs, the following simplifications are recommended by the editor of SOVIET GEOGRAPHY:

1. Eliminate the use of (') and (").
2. Use i for iy, and y for yy.
3. Convert diphthongs ay, ey, oy, uy to ai, ei, oi, ui.

THE PRESENT STATUS AND AIMS OF SOVIET GEOGRAPHY

By I. P. Gerasimov *

(A report to the Second Congress of the Geographical Society of USSR.)

(From Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1955, No. 3, Pages 12 - 24.)

The purpose of this report is to review briefly the present state of Soviet geography and to formulate the principal objectives confronting the science in its present stage of development. The complexity of this task is obvious; geography is one of the oldest sciences and in all its stages of development it has embraced a vast range of natural and social phenomena peculiar to given countries, regions or other parts of the earth's surface. Two major difficulties have always stood in the way of geography; one of them lies in the limitation of its subject matter; the other in the definition of the approach to the phenomena to be studied.

These difficulties have yet to be overcome. Heated debates have been waged and are being waged about this and other questions. However, for now I want to emphasize that in spite of disagreements about methodological questions, Soviet geographers are doing work of considerable practical and theoretical importance.

Those who have devoted themselves to geographic research over the years have produced a body of factual material characterizing similarities or differences in the physical environment, economy and population of the various countries. On the basis of these facts and their explanation, comparison and generalization, the theory of geography has developed. It has striven to ascertain and clarify the connection between natural phenomena in different parts of the earth's surface or between characteristics of the population and the economy in the various countries. For these reasons the geographer's work is distinguished by its generalizing and synthesizing character which is just as essential to the progress of science as the analytical work done within the narrower framework of a more specialized scientific discipline.

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* Director of the Institute of Geography of the Academy of Sciences of the USSR and ideological spokesman for the Soviet geographic profession. The views presented in this article, which was written five years ago, may not necessarily be the ideas that guide Soviet geography today.

Russian geographers have made an inestimable contribution to modern scientific knowledge of the physical environment and the economy and population, not only of their own country, but of the entire world. The names of outstanding Russian geographers are associated with studies of Siberia, the Far East, Central Asia, the Arctic and the Antarctic, all of which are areas difficult to reach and noted for their inclement natural conditions. The accomplishments of Russian geographic science have been further augmented by the work of Soviet geographers. Because of the favorable conditions for scientific development after the Great October Socialist Revolution, geographic studies have unfolded on an unparalleled scale in the Soviet period and produced important scientific and practical results.

Soviet geographic explorations in the Arctic since 1920 are well known. Soviet geographers have studied the central ice-covered parts of the Arctic Ocean, and on the basis of these explorations the Northern Sea Route was developed and new geographic discoveries of world-wide significance were made. In a sense Soviet Arctic explorations represent a continuation of the era of great geographic discoveries into the modern period.

Soviet topographers and geographers have promoted the systematic general geographic study of the Soviet Union by completing the mapping of its territory.

Geographic explorations of remote regions of Central Asia by Soviet geographers have promoted the economic development of the water, land and vegetation resources of these regions. Waterless and lifeless desert areas have been placed at man's disposal.

Equally important results have been yielded by geographic explorations in the forest regions of Siberia and the Far East. The rich, natural resources of these territories have been surveyed and methods for their exploitation have been worked out.

Detailed geographic work has also been carried on in the regions of the European part of the USSR, in the Urals and Caucasus, Kazakhstan and Western Siberia. It has played a key role in the ambitious program for the transformation of nature and the integrated utilization of natural resources of these territories. Successes have also been obtained in the geographic exploration of the Black, Barents, Bering and Okhotsk Seas. These explorations, like the Arctic work, have been accompanied by many noteworthy geographic discoveries.

The accumulation of factual data has gone hand in hand with the development of the Soviet theory of geography. V.V. Dokuchayev, on the basis of the geographic study of parts of European Russia and the Caucasus, has worked out the theory of horizontal and vertical natural zones, which was further developed by L.S. Berg. D.N. Anuchin and L.S.

Berg have greatly contributed to the development of a general earth science. P. A. Kropotkin, S. N. Nikitin and A. P. Pavlov, on the basis of their geographic work in Siberia and in the Great Russian Plain, have worked out a theory of the glacial period. The work of A. I. Voyeykov on the climatic characteristics of Russia and the rest of the world has been fundamental for modern climatology. The works of V. V. Dokuchayev, N. M. Sibirtsev, K. D. Glinka, and other Russian soil-science geographers developed the basis of a modern genetic soil science; the work of G. F. Morozov, A. N. Krasnov, N. A. Severtsev and others outlined the principles of geobotany and zoogeography. Russian oceanographers (S. O. Makarov, Yu. M. Shokal'skiy and others) made major contributions to the development of that discipline, and Russian cartographers -- A. A. Tillo and his followers -- raised Russian cartography to a high technical level.

Even in economic geography, the youngest geographic discipline, the contribution of pre-Revolutionary Russian scholars'was great. The very name of this discipline, "economic geography", was introduced by M. V. Lomonosov, and outstanding Russian geographers -- K. I. Arsen'yev, P. P. Semenov-Tyan-Shanskiy and others -- have enriched this science with works that have not lost their value to this time.

Soviet geographers have continued the development of the theory of geography using the classic heritage and the accumulation of new factual data. However , the decisive role in the formulation of a modern theory of Soviet geography has been played by the use of the principles of dialectic and historical materialism, and by the pronouncements of the classic writers of Marxism-Leninism on the geographic environment and its significance in the development of society. On the basis of these principles and pronouncements, the subject matter of physical geography has been defined as the geographic environment, i.e., the natural conditions of a given territory taken in their entirety and mutual relationships, and the principal theoretical aim of physical geography has been defined as the formulation of laws governing the formation of the natural geographic environment as a single whole on the earth's surface and in its parts. The Marxist doctrine of the laws of development of society and of the role of the geographic environment in social production has also been fundamental in formulating a theory of economic geography because only on the basis of Marxist doctrine has it become possible to work out scientifically all the theoretical questions concerning the geography of the economy of various countries and regions.

On the basis of these concepts of its subject matter and aims, geography can no longer be regarded as a single, undifferentiated science. Geography has been divided basically into two major scientific disciplines: physical and economic geography, the geography of population being included in the latter. This division ensues from the very nature of the objects studied by geography: natural phenomena, on the one hand, and social phenomena, on the other. Physical geography studies natural phenomena and thus proceeds from laws peculiar to the development of nature, i.e., natural laws. Economic geography studies social phenomena (the distribution of production) and thus proceeds from laws peculiar to the development of society, i.e., social laws.

Physical or economic geography is further divided into general and particular geographic disciplines. This is especially true in physical geography. Here, alongside a general physical geography or earth science (zemlevedeniye), studying the structure, development and distribution over the earth's surface of the mutually conditioned natural phenomena constituting the natural geographic environment as a whole, we find a regional physical geography concerned with the natural geographic environment within a given part of the earth's surface. In addition to these two major divisions of physical geography, independent scientific disciplines are concerned with the study of individual elements and objects of the natural environment. They include climatology, hydrology, geomorphology, soil geography, plant geography and zoogeography, on the one hand, and oceanography, glaciology, limnology, and permafrost science, on the other. The same process of differentiation is characteristic of economic geography, whose theoretical aim is to formulate the laws of social production, and of the conditions and characteristics of social production in given countries and regions. In addition to general and regional economic geography, which are concerned with the distribution of social production as a whole or within countries and groups of countries, the geography of industry, agriculture and transportation is beginning to develop and assume separate status.

Geography thus represents a whole system of scientific disciplines having their own subjects and methods of study. All these disciplines, however, form the closely interconnected complex of geographic sciences based on the overall aim of geography and on the close interrelationships between all objects studied by it. By studying the various elements or phenomena of the natural environment or of society, the separate geographic disciplines make their particular contribution to the solution of the general scientific objective of geography, which is the study of the natural geographic environment and of the geography of the economy and population of the whole world or its parts.

The results of studies of the natural environment, economy and population of countries or other parts of the earth's surface have long been set forth in the form of geographic descriptions and maps of these countries and regions. Therefore, work of a comprehensive regional character always has been and will continue to be one of the most important kinds of output in the field of geography. As our knowledge increases and the theory of the geographic sciences develops, the content of regional description is increasingly perfected through greater precision of the geographic facts communicated, as well as through deeper scientific analysis of these facts and a broad scientific generalization. As a consequence, an elaboration of the methodology of regional description and mapping has always been one of the most important tasks of geography. Its solution is essential for continued progress of the whole system of geographic knowledge.

The present report cannot of course characterize exhaustively the state of each of the above mentioned geographic disciplines in the USSR. These disciplines, taken separately, and even more in their entirety, are characterized by major practical and theoretical achievements.

Valuable contributions to the theory of general physical geography have been made by Soviet geographers in the development of the theory of latitudinal and vertical natural zones and their physical and geochemical interpretation, in the solution of problems in paleogeography (particularly the history of the glacial period and its role in the development of the contemporary environment) and in the practical approach to the delimitation of physio-geographic regions.

In climatology, Soviet geographers have worked out problems of the origin and forecasting of climatic phenomena resulting from the interaction of atmospheric processes with elements of the earth's surface. They have also developed principles and methods in agricultural climatology. In hydrology of the land, a number of new laws governing surface runoff have been established on the basis of a water resource survey of the Soviet Union. In geomorphology, the origin of the present relief of the Soviet Union, resulting from the interaction of endogenic and exogenic processes and, in particular, from recent tectonics, has been worked out. In biogeography, considerable advances have been made in the study of the geography of soils, in the theory of plant associations and their interrelations with the environment and in the new ecologic-geographic trends in zoogeography.

In oceanography, in addition to major geographic discoveries and outstanding practical achievements, large generalizing works on the seas of the Arctic, the Caspian Sea, etc., have been produced.

In Soviet times geographers have produced a number of generalizing studies on the physical and economic geography of the USSR, some foreign countries and the world as a whole. They include L. S. Berg's work on the natural geographic zones of the USSR: A. A. Grigor'yev's on the characterization of world geographic belts, and textbooks on the economic geography of the USSR and foreign countries compiled by N. N. Baranskiy and I. A. Vitver. Soviet cartographers have produced excellent maps of the USSR (for example, hypsometric maps) and a number of first-class atlases, such as the Atlases of the World and of the USSR and the Maritime Atlas.

Soviet geography, in short, has undoubtedly achieved considerable advances in the development of theory and in the introduction of the results of its work into the national economy and Soviet culture.

Nevertheless, these achievements are still insufficient in the light of the great cultural demands of the Soviet people and the requirements of communist development. The work of Soviet geographers still suffers from considerable defects that must be removed if our science is to continue its forward march.

The principal defects have been aired in the protracted discussion of general theoretic questions that have taken place in the last few years in our scientific journals. This discussion has unquestionably been beneficial to the development of Soviet geography. It has permitted us to assess the general state of the theory of geography, to establish its basic principles, to determine existing disagreements and to evaluate the principal trends in the solution of general theoretic problems.

A recapitulation of the discussion has shown that the main reason for the serious defects in the present state of geographic theory is the fact that Soviet geographers have not yet learned how to make creative use of the philosophy of dialectical materialism in their specific discipline.

This has been evident especially in the inadequate struggle Soviet geographers have put up against the pseudo-scientific,idealistic and metaphysical views of leading bourgeois scholars and against the reactionary nature of many contemporary foreign geographic concepts of a neo-Malthusian, geopolitical or racist character. Moverover, some elements of idealistic or metaphysical concepts proposed by leading geographers, such as A. Hettner, have been uncritically accepted by some Soviet geographers, such as Academician L. S. Berg. This great Soviet geographer to some extent repeated the mistakes of many naturalists who in the 19th and at the beginning of the 20th century, in spite of the fact that they had discovered the objective laws of the development of nature in their specific research, were under the influence of incorrect methodologic attitudes in their own general theoretic views.

The discussion has also brought out scholastic errors in the work of Academician A. A. Grigor'yev, which he has acknowledged and is striving to correct; as well as vulgar nihilistic pronouncements by some Soviet geographers, such as A. M. Smirnov and P. S. Makeyev, on the delimitation of natural regions and in paleogeography.

Among other methodologic defects of Soviet geographic work is the inadequate emphasis given to the influence of the economic activity of society upon its natural environment. This defect in a number of studies in physical geography has led to a purely naturalistic approach to the geographic characterization of a given area, the absence of a clear assessment of its natural resources and a lack of evaluation of the possibilities of economic development. It should be stressed that such physical geographic studies assume an abstract, abstruse character that does not satisfy the requirements of a socialist national economy and culture.

At the same time the discussion brought out a similar defect in economic geographic studies that content themselves with a superficial analysis of the role of the natural environment in the economic activity of society. Such an approach also results in the abstract, abstruse character of such studies, the stereotyped utilization of mere sociologic plans, and an underestimation of the local geographic characteristics in the development of society.

A number of economic geographic studies conducted by Soviet geographers have also suffered from serious methodologic defects in underestimating or incorrectly understanding the inseparable connection between the productive relations and the productive forces in the development of economic geographic phenomena. In some cases, self-sufficient significance has been attached to the productive forces, which have been studied and analyzed without due regard to productive relationships. In other cases the study of the distribution of social production has been made without sufficient consideration of the conditions of the geographic environment that influenced it. In both cases, the commission of theoretic errors has prevented a fruitful treatment of the theorectic and practical questions of economic geography.

The discussion also showed that the vast amount of factual data being accumulated in geographic studies in the USSR is still not being subjected in due measure to theoretic elaboration and generalization. This is hampering the further development of the theory of Soviet geography and results in the appearance of theoretic views of an abstract scholastic character, insufficiently grounded and verified on the basis of specific geographic studies.

The past discussion has thus shown that while Soviet geography has attained considerable theoretic and practical accomplishments, it has been confronted by many new tasks that require further stimulation of theoretic thought. This should be directed not only toward meeting the demands of current studies, but also toward finding more efficient ways of utilizing the natural wealth of our land and the productive forces of our people for the welfare of the communist society being built in the USSR.

These tasks and these new requirements may be briefly formulated as follows:

1. A major task of Soviet geography is the promotion of geographic field work in all the regions of the country in conjunction with their further economic development, the transformation of nature and new large-scale construction projects.

Soviet geography has a great deal of experience in such field work. However, one of its serious defects is the lack of a sufficiently integrated approach. The integrated character of field work is often understood simply as the execution of various specialized studies within the framework of a single field party but without the close interrelationship that would insure the integrated solution of a common objective.

Economic geographers have a responsible role to play in the organization of such integrated field work. Among the current tasks of Soviet economic geography are problems relating to the further integrated economic development of the various regions of the country, the analysis of the various types of productive structures of these regions, and problems relating to the most efficient division of labor among regions. Our planning organs are doing a large amount of work of this nature in which economic geographers should take an active part.

Special significance is being attached to geographic work being done in connection with the drive for a sharp increase in the productivity of agriculture. The discussion of the 19th party congress and the latest party resolutions emphasize the need of taking account of conditions in carrying out various agricultural measures. Geographers have an important part to play here. Academic people, research personnel, and the many local area specialists must join actively to implement the resolutions of the party and government regarding agriculture.

Among the geographers' tasks are the generalization of accumulated data on the natural and economic conditions of a given territory in the interest of the correct planning of the agricultural measures; the systematic introduction into local practice of the latest achievements of science, directed toward the further increases of farm productivity; the analysis and publicizing of the experience of leading farmers; and the organization of field work designed to uncover unexploited natural and economic resources of the various regions for the further development of crops and livestock raising and increases in productivity.

The need for such integrated field work is especially great in the eastern regions of our country, where large areas of idle and virgin lands are to be put under the plow in the next few years. These regions combine favorable characteristics such as large areas of fertile lands with some unfavorable ones such as drought or extreme continentality of climate, insufficient water supply or poor drainage and the possibility of heavy erosion as a result of poor farm practices.

Furthermore, the agricultural development of the eastern regions will require the building of a new transportation net and establishment of new population centers. These measures can be realized only if the whole complex of local geographic conditions, both natural and economic, is taken into account on the basis of available data or as a result of new geographic field work.

There is no doubt that, in addition to contributing to the solution of practical problems, such geographic field work opens up opportunities for obtaining new data of significance for the development of all Soviet science. The scientific analysis of the data will stimulate the development of new methods and new theoretical problems both in geography and in other sciences.

2. It would be wrong to limit the present tasks of geographic field work to the study of regions of new agricultural development. Soviet geography is also confronted by the important tasks of further studying well-known and thoroughly developed territories.

Here geographers should study the changes effected in the natural environment and economy, and in the composition, distribution and living conditions of the population as a result of Soviet economic development. The findings of these studies should be published in the form of basic works on the physical and economic geography of the Soviet Union as a whole and of its parts. Along with a characterization of the natural environment, the population and present state of the economy, the work should also propose further courses of development of the regions concerned.

Such geographic work is of major significance for meeting the needs of the economy and culture of the Soviet people. Scientific and popular geography books on the Soviet Union, its natural resources, its economic power and its diversity of population will help nourish Soviet patriotism and pride in the successes of the country of socialism. They will give a realistic picture of the results of the creative work done by the Soviet people in exploiting the natural resources of the country, in developing its industry and transportation, in promoting its agriculture and in raising the standard of living. Geographic studies containing information on the state of the economy and prospects of development of the regions of the USSR will assist persons in all fields and put them abreast of current problems.

It must be acknowledged that this important task in the field of Soviet geography has been carried out thus far on an inadequate scale, mainly because of poor organization. Yet the shortage of serious scientific generalizations on the physical and economic geography of the USSR weakens the authority of the profession, reduces the effectiveness of its contributions to the nation's economic development and impedes the development of the theory of Soviet geography. It is obvious that the theory can be elaborated only on the basis of analyses and generalizations of diverse factual data. Without such a basis, theoretical research remains abstract, forced, fruitless and divorced from life and reality.

3. It must be added that Soviet geographers are expected to produce not only geographic studies of the Soviet Union but also of foreign countries, both the people's democracies and the capitalist countries.

The importance of this work is obvious. Only under these conditions can Soviet geography expect to hold a leading place in world science. Many foreign countries have published comprehensive works embracing the whole world. These works, while containing valuable factual material, suffer from serious methodological defects, especially so-called "vulgar geographism," which distorts, usually intentionally, the true causes of various geographic phenomena. Many Western geographic publications, moreover, are loaded with racism, geopolitics, neo-Malthusianism and other reactionary ideas. Others are under the influence of the "chorologic concept," representing a sort of agnosticism in geography, or are emasculated from a scientific point of view.

Soviet geographers working in foreign regional geography should therefore produce studies in which physical and economic aspects of various countries are analyzed and explained from the Marxist point of view. This task is entirely within the capacity of Soviet geographers; its execution depends on the mobilization of personnel, correct methodology and sensible organization of the collective effort. It is necessary to emphasize the significance of this effort by Soviet geographers in the struggle against pseudo-scientific fabrications and reactionary propaganda found in foreign geographic publications.

4. One of the main sources of socialist growth of production is the full utilization of natural resources and elemental forces of nature, on the basis of man's vigorous and purposeful action upon these natural forces and phenomena. Soviet science and, above all, Soviet physical geography, having accumulated much experience in the study of contemporary natural phenomena, must now intensify its research in this direction. Geographers must expand their study of these processes, of the methods of forecasting them and of ways of regulating and transforming them in the interest of the economy. The handling of this problem is one of the most important trends in contemporary physical geography because it obliges geographers to pass from the study of static geographic phenomena to the direct investigation of such phenomena in the dynamic state.

One of the key problems of this type involves man's transformation of the heat and water balance of agricultural areas. The productivity of any agricultural area is greatly dependent on the amount of solar heat and atmospheric humidity, their distribution through the growing season and their interrelationships. Over the centuries farmers have worked out a whole system of measures aimed at the most efficient use of the available heat and humidity. On the other hand, scientists and farm specialists have now elaborated methods of acting upon the natural processes to alter the natural heat and water balance of a given area in the interests of agriculture, forestry and water management. Many such methods have already become part of economic management and are being applied with success. However, there are further possibilities of regulating the natural heat and water balance of farm lands to raise their productivity, especially through the application of modern technology and the principles of Michurinist biology [concerning inheritance of acquired characteristics]. In fact the possibilities are limitless because man's ability to influence natural processes grows with advances in technology.

Physical geography in the USSR is already actively concerned with this important problem. Let me simply recall the interesting work done by our climatologists, hydrologists, geomorphologists and others in the planting of shelter-belt trees, in snow conservation and in the study of farm techniques and their influence on the water and heat balance and the processes of erosion. There is no doubt that Soviet geographers have as yet made only the first steps in this direction. The further development of Soviet physical geography will require serious efforts for the solution of these tasks. This means not merely expanded studies of natural phenomena and of ways of acting upon them; it means greater depth in our scientific work and the use of more precise and rapid methods of investigation (especially in the study of the modern dynamics of the natural phenomena), requiring in turn the introduction of improved techniques.

5. Economic geography also faces new and responsible tasks connected both with the further growth of productive forces in a socialist society and with their proper areal distribution.

The resolution of the 19th party Congress contains a direct reference to the need of improving the geographic distribution of the construction of industrial enterprises with a view to bringing industry still closer to the sources of raw materials and fuel and eliminating abnormally long hauls. Later party resolutions have called for higher farm productivity, particularly by adding new farm land in many regions of the country. These resolutions outline new objectives for the delimitation of industrial and agricultural regions and set additional theoretical and practical tasks for economic geography involving the geographic division of labor and the distribution of socialist industry, agriculture and transportation.

The solution of these problems is , of course, inseparably connected with the comprehensive geographic study of regions of new economic development and with generalization of the whole body of geographic data accumulated earlier. By thus combining practical and theoretical work, Soviet geography will be able not only to meet the demands placed upon it by the work of communist construction, but also to develop this work by pointing out new ways of economic development of various regions of the USSR.

I will now take up questions of scientific organization. The proper solution of these questions is an essential condition for the further development of Soviet geography. The organization of Soviet geographic work at present suffers from several serious defects. Chief among these are the scattering of the geographic personnel, the inadequate development of geographic research institutes and their uneven distribution. The total number of qualified geographers in the USSR is very large. There is a whole army of specialists scattered through research institutes, higher educational institutions, and planning, designing and surveying organizations.

Nevertheless, geography still is not properly represented at the headquarters of Soviet science, the Academy of Sciences of the USSR.

This is evident from the limited number of active members and corresponding members of the Academy representing geography, from the poorly developed system of geographic research institutes and their small size.

There is great need for a broadening of representation of the geographic sciences in the Academy of Sciences of the USSR and in the academies of sciences of the union republics, and for the further development of geographic institutes.

In particular, there is great need for the organization of new institutes of geography in the Academy of Sciences of the Ukrainian SSR and in the Academy of Sciences of the Uzbek SSR; for the transformation of the sector of geography into an Institute of Geography in the Academy of Sciences of the Kazakh SSR; for the organization of sectors of geography in the Academies of Sciences of the Armenian SSR, the Tadzhik SSR, and the Turkmen SSR, as well as in the larger branches of the Academy of Sciences of the USSR, such as the West Siberian branch; and, finally, for the strengthening of the existing institutes of geography in the Academies of Sciences of the USSR, of the Belorussian SSR and of the Georgian SSR.

In view of the great tasks facing geography in its present stage of development the Presidium of the Academy of Sciences should be asked to organize an independent division of geographic sciences, which would unite all geographic institutions now under the Academy and would tie their work more closely to that of other geographic institutions. This would make it possible to strengthen the organization of these institutions and to coordinate their work properly.

Furthermore, there is need for expanding markedly the network of integrated geographic field stations that carry on research on natural phenomena and processes.

In addition to setting up new stations in areas where they are lacking, we must also expand integrated field work for the study of natural phenomena in the existing nature preserves. For this purpose certain nature preserves should be placed under the direct management of the geographic institutes in the system of the Academy of Sciences of the USSR and of the academies of sciences of the union republics. The geographic institutes should strengthen their guidance of the work of the nature preserves.

Closely connected with the question of strengthening the geographic institutes is the question of training young geographers. This question will be given special attention in the work of our congress. However, I should like to make a few remarks concerning the basic principles to be followed in training young geographers.

There is no doubt that specialization is needed in the training of new geographers. The young geographer who has been graduated from a higher educational institution should above all be able to do independent research work in his geographic discipline. However, the specific nature of every geographic science, whether geomorphology, hydrology, climatology, oceanography, geography of soils or geobotany, requires, in my opinion, the preparation of specialists on a broad general geographic base. Research work in any given geographic specialty requires not only specialized knowledge and habits, but also correct understanding of the interrelationships between geographic phenomena. Thus, a basic principle in the training of new geographers is the proper combination of thorough specialized preparation with a broad general geographic education.

However, along with the preparation of specialists in the separate geographic disciplines, the geography departments of the universities and teachers colleges must also provide for the preparation of broadly educated geographers possessing the necessary knowledge in all the main fields of general and regional physical and economic geography. The socialist economy and Soviet culture absolutely need such specialists. In physical geography they are needed to conduct integrated studies of the natural environment and the natural resources of the various regions of our country, and to carry out work in regional geography and cartography; in economic geography they are needed to work out problems involving the integrated development of the economy of regions, the delimitation of economic regions, regional economic geography and economic mapping.

There is a tremendous demand for middle-school geography teachers with such broad qualifications. However, the training of such geographers is difficult and complex. We should analyze carefully the available experience in the training of such geographers, especially within our leading higher educational institutions, with a view to making the most effective use of such experience.

A few remarks regarding the publication of geographic literature. It seems to me that, in spite of the organization of a special geographic publishing house and a considerable expansion of the output of geographic literature in the last few years. there is still a real need for further development of geographic publishing, activity especially in the case of the periodicals. The existence of only two scientific geographic journals in our country is clearly inadequate. We must endeavor to increase their number and volume.

The questions of organization of research work in the field of geography, the training of new geographers and the expansion of geographic publishing bring us to the specific purpose of our congress: discussion of the activity of the Geographical Society, which is a broad association of all Soviet geographers. My report will not specifically deal with this subject, which will be given special attention in the course of our work. I should like only to express the conviction that our Geographical Society, which has already played such a great role in the development of Soviet geography will continue to exert a far reaching and beneficial influence upon the further course of development of Soviet geography and will be able to solve the tasks now confronting all Soviet geographers.

With this I terminate my report. I have tried to show that the present stage in the development of Soviet geography requires that the level of creative research be raised further to meet the requirements of the socialist economy and culture. The fulfillment of this requirement is a matter of honor and duty for all Soviet geographers. Guided by Marxist theory and relying on the past experience of socialist construction, Soviet geographers will, of course, be able to cope with the tasks placed before them by the mighty advance of our country toward communism.

THE WORK OF THE INSTITUTE OF GEOGRAPHY OF THE ACADEMY OF SCIENCES OF THE USSR IN 1957

By D. V. Kravchenko

(From Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1958, No. 3, Pages 147 - 150).

Scientific research of the Institute of Geography of the Academy of Sciences of the USSR had the following objectives in 1957:

(1) The production, on the basis of a generalization of accumulated data, of regional geography studies of the USSR and foreign countries.

(2) Integrated geographic field work, mainly in the eastern part of our country, to study the natural resources and the development of the productive forces of regions in connection with their intensive economic development and new construction.

(3) The study of the dynamics of contemporary physical geographic phenomena with the object of working out the scientific bases for forecasting of natural processes and the controlled transformation of natural conditions designed to raise the productivity of the territory. Special significance was attached to studies of the heat and water balance of the earth's surface and its role in the dynamics of the natural processes and in the origin of geographic differences, as well as to the study of ways of transforming the heat and water balance for practical purposes. The Institute of Geography also carried on studies in 1957 according to the program of the International Geophysical Year (in the section on glaciology and, in part, in the section on climatology).

(4) Paleogeographic studies of the development of the contemporary environment designed to obtain the key to a correct understanding of contemporary geographic laws.

(5) Studies in the history of geography:

The Institute's program was drawn up in accordance with the resolutions of the 20th party congress and other government and party resolutions, which called special attention to the need for proper specialization and integrated development of the economy of the economic regions of the country, to the more rational utilization of their natural and labor resources for the purpose of raising labor productivity, and to the more efficient development of the natural resources of the eastern regions of the Soviet Union.

In conducting its studies, the Institute of Geography obtained in 1957 a number of noteworthy results, both in finished and still continuing work.

In the preceding years the Institute had published (with the participation of the academies of sciences of the union republics and some universities) a number of monographs on the union republics and the main economic regions of the RSFSR, some monographs and a number of symposia on the geography of the people's democracies, and a number of monographs on the geography of the capitalist countries.

In 1957 the publication of regional-geography monographs was continued. In the field of USSR geography, books were published on the Azerbaydzhan SSR, the Kazakh SSR, the North Caucasus, the Volga Region, the Turkmen SSR (2nd edition), and the Estonian SSR (2nd edition). In the field of the geography of foreign countries, published works included a study of soil types and soil regions of the Chinese People's Republic, a book on Vietnam and a collection of articles on the geography of industry of the United States. Manuscripts were received for monographs on Germany, Burma, Western and Northern India and the northern United States. Work was continued on books on the geography of a number of other regions of the Soviet Union, the people's democracies and capitalist countries. In particular, work was completed on large monographs on the physical geography of the Urals, Western Siberia and the Far East.

In 1957 the Institute participated in the work of the Academy of the Rumanian People's Republic and the Bulgarian Academy of Sciences, which are continuing the preparation of comprehensive geographic monographs about their countries. The Institute also took part in field work of the Chinese Academy of Sciences to study the geography of Sinkiang and the processes of erosion in the loess regions of the middle Yellow River.

The Institute has devoted attention to studies of regions of recent economic development. The creation of a great new scientific research center in the east of our country - the Siberian Division of the Academy of Sciences of the USSR - has led to the Institute's intensified work in Siberia and the Far East. Staff members of the Institute joined field parties of the Council for the Study of Productive Forces of the Academy of Sciences of the USSR in Krasnoyarsk Kray (the southern part of the kray), the Chulym-Yenisey region, the Tuva Autonomous Oblast and the Trans-Angara region and in Chita Oblast. Staff members also joined the integrated field group of the Council for the Study of Productive Forces in a study of the physical geography of the Amur basin, begun in conjunction with Chinese scientists. Geomorphologic and paleogeographic field studies were carried out in the eastern part of the Bol'shezemel'skaya Tundra and on the western slope of the Polar Urals. The geomorphology of areas adjoining the Karakum Canal was also studied. Some results of this work have been worked up both in the form of reports and maps for interested organizations and in the form of articles for the press. Staff members of the Institute have read papers at the joint session of the Division of Biologic Sciences and the East Siberian branch of the Academy of Sciences of the USSR in Irkutsk and at the joint Chinese-Soviet Conference of the Amur and Heilungkiang field parties of the Academy of Sciences of the USSR and the Academy of Sciences of the Chinese People's Republic.

Studies of the heat and water balance of the earth's surface received further attention. Both theoretical and practical results were obtained.

A long study of the erosion processes in the forest-steppe belt of the European part of the USSR was completed and a monograph dealing with the planning of shelter belts on the basis of physical geographic laws has gone to the publisher. A symposium on agricultural erosion and new methods of studying it was prepared for publication jointly with the Forestry Institute of the Academy of Sciences of the USSR. The Institute is continuing studies in this field, which is of great economic significance, both in the Soviet Union and, since 1957, along the middle course of the Yellow River in China.

Having studied the regulating effect of cultivating techniques upon surface runoff, the Institute in 1957 investigated the formation of a water basin and of surface runoff under the conditions of a dissected area of the forest zone. On the basis of data from previous studies, a number of articles were prepared and sent to the press on the effectiveness of water-conserving tree belts along rivers, changes in river discharge under the influence of crop farming, and methods of regulating the water balance of cropped fields.

In conjunction with the Main Administration of the Hydrometeorologic Service, the Institute studied the agroclimatic and hydrologic bases for the distribution and specialization of agriculture in the USSR and prepared an integrated study of the climate of the natural zones of the USSR, to be a part of a joint monograph. A study on climatic regions of the USSR was done for the State Planning Committee for the purpose of determining consumption standards of a number of commodities.

In 1957 the Institute proceeded to deal with the question of the water and heat balance of irrigated and unirrigated fields and its zonal characteristics. Field work was conducted in the irrigated fields of the Golodnaya Step' on a study of the moisture balance of the soil horizons penetrated by plant roots. Findings regarding the methods of measuring the water requirements of cotton were prepared and handed over to the Main Administration of Water Management of the Ministry of Agriculture of the USSR and the institutions of the Uzbek SSR.

A monograph on desert water bodies and their utilization, prepared in preceding years, was published recently. Continuing its investigations on this subject, the Institute undertook, jointly with the Academy of Sciences of the Turkmen SSR, experimental and field work on the study of intermittent surface runoff and the possibilities of artificial fabrication of ground water under conditions of limited water resources.

Of great significance for the further study of the water and heat balance of the earth's surface was a working conference on this problem organized in 1957 by the Institute of Geography. Representatives of a number of academic and non-academic institutions took part in the work of this conference (1).

Considerable theoretic and practical results were obtained by the Institute in elaborating the scientific bases of the forecasting of natural phenomena under various physical geographic conditions.

On the basis of investigations conducted jointly with the Central Scientific Research Institute of Geodesy, Aerial Photography and Cartography and with other scientific institutions, the Institute published a monograph on crustal movements in the western half of the European part of the USSR. In 1957 the study of contemporary tectonic movements, with the use of repeated high-precision levelings, was continued in the Ural piedmont, in Western Siberia and along the perimeter of the Caucasus. Besides its theoretical and methodological significance, this work also has practical value for geodesy, marine hydrography and large-scale construction projects (forecasts of the deformation of permanent structures, canals, dams, bridges, railroads, etc.).

Work is being completed on the study of contemporary crustal movements in connection with earthquakes in the mountain regions of Soviet Central Asia. As a result of a geomorphic study of the seismically active Garm area (Tadzhik SSR), a close relationship between the distribution of earthquake foci and the tectonic mobility of the earth's crust in post-glacial times has been established.

On the basis of a study of mudflows in the region of the Georgian Military Highway, a book is being prepared for the press analyzing the geomorphic and hydrologic conditions of formation of mudflows and possible forecasting techniques.

Snow-cover studies were made in the Tien Shan, in the Elbrus area and in the Moscow region. On the basis of the results of the work done in 1957 and preceding years, articles have been prepared and are being printed on the role of snow in the soil-forming processes and in the formation of the plant cover, on the effect of snow upon geomorphic processes, and a number of other subjects. A map of the world's snow cover has been compiled.

A prominent place in the Institute's work in 1957 was occupied by the organization and execution of a series of glaciologic field studies according to the program of the International Geophysical Year. The Institute organized and put into operation Arctic glaciologic stations on Franz Josef Land (Hooker Island), on North Island of Novaya Zemlya and in the Polar Urals (upper course of the Shchuch'ya River). Jointly with the academies of sciences of the Kirghiz, Kazakh and Uzbek Republics, the Institute of Permafrost Science of the Academy of Sciences of the USSR and Tomsk University, thermometric observations were made in the mountain-glacier regions of the USSR. At the request of the Academy of Sciences of Bulgaria, the Institute of Geography took part in thermophysical observations on the glaciers of the Pirin Mountains in Bulgaria.

In 1957 the Institute of Geography continued its work in the Antarctic through the staff of the marine and continental groups of the Antarctic expedition of the Academy of Sciences of the USSR. In addition to glaciologic observations, staff members carried out meteorologic and synoptic observations and studies as well as ocean-bottom studies adjacent to the Antarctic continent.

Paleogeographic studies also continued. A large monograph devoted to the history of forests and the paleogeography of the USSR in the recent epoch was published in 1957. Work was continued on the study of the history of formation of the river valleys of the Volga and Oka and the paleogeography of the glacial formations and post-glacial deposits of the Russian Plain. A number of articles were published on these studies. A large monograph is also being published on the changes in animal life in the steppe zone and forest steppe of the USSR, from the 13th to the 19th century. A book is in preparation on changes in the composition of animal life of the USSR during the same period in the forest zone and the forest tundra.

Having studied the history of geography in Russia since antiquity, the Institute in 1957 published a book on the history of geography in the 18th-century Russia. Two other books in press, on the history of geography in Russia in 1725-1765 and on the development of physical geography in Russia in the capitalist period, represent the first attempt to characterize the development of physical geography in Russia in the 19th and the beginning of the 20th century (to 1917), both in general and regional geography and in the specific physical geographic disciplines.

In 1957 the Institute of Geography held several large conferences and took part in many conferences and conventions. Besides the above-mentioned conference on the study of the water and heat balance of the earth's surface, the Institute conducted a co-ordinating conference on the problem of the "Geography of the USSR," attended by representatives of the academies of sciences of the union republics, the branches of the Academy of Sciences of the USSR and a number of universities; a conference on the scientific evaluation and inventory and methods of conservation of natural resources; a working conference on the organization of glaciologic field work under the program of the IGY; and the jubilee meeting of the Institute's Council, marking the 40th anniversary of the Great October Socialist Revolution. The Institute of Geography took part in the work of the Third Soviet Hydrologic Congress, in the International Conference for the Study of the Quaternary Period, in the Conference for the Preservation of Nature, in the combined scientific session of the Division of Biologic Sciences and the East Siberian Branch of the Academy of Sciences of the USSR, and others. Staff members of the Institute of Geography read papers in Leningrad, Irkutsk, Kustanay, Kiev, Simferopol' and Odessa.

The relations between the Institute of Geography and foreign institutions were broadened and strengthened. Staff members of the Institute traveled to Sofia, Bucharest, Warsaw, Berlin, Prague, Peking, Tokyo and Toronto. At meetings of the Council of the Institute, papers by scientists from Rumania, Poland, Czechoslovakia, Canada and the United States were heard and discussed. In 1957, the Institute was visited by about forty foreign scientists.

The annual meeting of the Council of the Institute of Geography and departmental meetings noted an increase in the research and scientific-organization activity of the Institute of Geography in 1957, and a strengthening of the Institute's ties with the academies of sciences of the union republics, with the branches and divisions of the Academy of Sciences of the USSR, with government agencies and with foreign geographic institutions. Serious defects in the work of the Institute were also pointed out, particularly the inadequate work in the theory of economic geography and in experimental and laboratory investigations in physical geography.

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1. A report on the work of this conference was printed in Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1957, No. 5.

RESULTS AND AIMS OF PHYSICAL REGIONAL GEOGRAPHY IN THE USSR

By E. M. Murzayev

(From Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1957,
No. 5, Pages 50 - 55).

Regional geography studies published in the last few years have consisted of regional studies with a predominantly economic geographic content, regional studies with predominantly physical geographic material and integrated regional studies.

This article deals with physical geographic studies of an integrated character completed at the Institute of Geography of the Academy of Sciences of the USSR or now in progress. A large number of such studies have also been undertaken at higher educational institutions in Moscow and other cities.

Regional geographic studies must, above all, generalize scattered data on natural phenomena in a given area to obtain an integrated regional characterization interrelating all its elements.

Of course, mere description of the regional type does not solve this task. A physical map is also to some extent the result of generalization, but is constructed by other methods and with another aim and cannot therefore replace physical description. Modern physical geography is having difficulties in generalizing factual data. These difficulties are due to various causes. In view of the vast and varied amount of basic factual data with which the geographer has to deal, and because of complex differentiation of science, it is becoming increasingly difficult to make a broad scientific generalization at the proper level, befitting the present status of the various geographic sciences. The territory of the Soviet Union, with its highly diversified physical geography, presents special difficulties.

Because of the great differentiation of modern geography, generalized studies on specific problems are appearing with increasing frequency while integrated studies, despite their importance, are being published relatively seldom.

It is not easy to name any major studies characterizing a given country or a large region of the Soviet Union according to a full program reflecting all elements of the regional complex, namely physical basis, population and economy.

We are all familiar with the classic monographs by L. S. Berg, who accomplished a tremendous amount of work in his lifetime and gave a full description of the physical basis of the Soviet Union in his studies of the USSR, Priroda SSSR (The Natural Environment of the USSR) and Geograficheskiye Zony Sovetskogo Soyuza (The Geographic Zones of the Soviet Union), essentially unexcelled thus far.

In the line of similar,but more localized studies, we may cite the well known books on the European and Asiatic parts of the Soviet Union written by B. F. Dobrynin and S. P. Suslov. The interconnection of the separate parts of these books and the strict system of selection of facts make them genuine scientific research, although the books are not aimed solely at scientific people.

The Institute of Geography of the Academy of Sciences of the USSR in the post-war years has published a fairly large number of books on the natural environment of the Soviet Union in the series Priroda SSSR (2), which varies greatly in content, areal coverage and presentation.

The series as a whole has been well received by the readers. It is reliable in terms of the facts presented and simple in language, but it lacks consistency in structure. In some books the study area is divided both into natural zones and belts and into physical geographic regions, i.e., a double regionalization, so to speak. Such a structure, which seems to us quite correct, has been used in the book Yevropeyskiy Sever (The European North) by G. D. Rikhter. In other books, the zonal characterization has been used only in describing the vegetation and soils, but not the physical geography as a whole, as in Nizhneye Povolzh'ye (The Lower Volga Region). The third type of books under discussion has no description of the physical geographic regions at all, except for geobotanical subdivisions (as in the book Kazakhstan).

Thus, the old series Priroda SSSR cannot be regarded as uniform. Its authors solved problems of organization and methodology in different ways. The books were generally written by small groups of authors or by a single author.

Recently, books with similar organizations have been published in Moscow and in the provinces. Among these are Sibir' (Siberia) by N.I. Mikhaylov, which has already passed through two editions; Kavkaz (The Caucasus) by N. A. Gvozdetskiy, and a number of others. These books also use different approaches. Sibir' follows the classic type of regional and zonal organization while Kavkaz emphasizes the geological and tectonic factors. Perhaps this is permissible in the case of mountain areas.

Let me also note the large book Ocherki po fizicheskoy geografii Kazakhstana (Essays on the Physical Geography of Kazakhstan), published in Alma-Ata (1952). The title of this book correctly reflects its contents, for it gives a characterization of only the individual physical elements, such as the geologic structure, the climate, the rivers, etc. It makes no attempt to integrate the physical geographic description of this large territory or to describe the various regions.

In the last few years the Institute of Geography of the Academy of Sciences of the USSR has undertaken to publish scientific monographs on the large natural regions of the Soviet Union. Such monographs are designed to provide a more thorough analysis of the natural characteristics of a given region.

In scope and level of presentation, this series is to be distinguished from the earlier series Priroda SSSR.

Thus far only two monographs of the new series have been completed: Lesostep' i step' Russkoy Ravniny (The Forest-Steppe and the Steppe of the Russian Plain) and Srednyaya Aziya (Central Asia). Both are the work of groups of authors under a leading editor. Besides these two, books on the Urals, the West Siberian Lowland and the Far East are to be completed soon. Books on the rest of the Soviet Union are planned.

How should we draw the boundaries between these large physical geographic areas, i.e., how shall we divide the territory of the Soviet Union for the purposes of regional description? This problem is neither clear nor simple. Central Asia, for example, is separated from Kazakhstan by an administrative-political boundary, but not by a natural frontier. We know quite well that the physical-geographic boundary of Central Asia runs north of the Lake Balkhash and Aral Sea basins. But if we show Central Asia within its natural boundaries, the integrity of the territory of Kazakhstan, to be described in physical-geographic terms, will have been destroyed beforehand.

In some cases, therefore, we must evidently ignore the natural frontiers to make allowance for the constituted politico-administrative divisions. We should try, moreover, to combine these two principles as much as possible. According to the publication plan of the new series on the physical geography of the USSR, the whole territory of the Soviet Union is to be treated in twelve monographs: the forest steppe and steppe of the European part of the USSR, the non-chernozem belt of the European part of the USSR, the Caucasus, the Urals, Kazakhstan, Central Asia, Western Siberia, Transbaykalia, Central Siberia, Yakutia, and the Far East.

How should scientific monographs in regional physical geography be handled? It seems to us that the basic background in physical geographic characterization is the descriptive material. This must not and cannot be weakened or excluded, for the concrete facts that the reader has a right to expect in any geographic study are contained mainly in the descriptive material. At the same time the descriptive material should not be given photographically, but with appropriate interpretation. It should be treated historically; for example, the formation of the contemporary environment, beginning at least with the Cenozoic. As a rule, there is no need to go further back into geologic history, since in virtually all cases it is not reflected in the contemporary landscape. The inclusion of paleogeographic data makes it possible to explain vividly many troublesome facts relating to contemporary physical geography.

Integrated physical geographic monographs must stress the interrelationships between natural phenomena. Such monographs should not consist of disconnected essays, though such treatment may also be regarded as legitimate. But when we speak of regional monographs in physical geography, we mean integral studies in which all natural elements are shown in close interconnection to explain the causality of natural phenomena. Therefore, the causality of natural phenomena and the interconnection between them should be emphasized in the types of studies we are discussing.

Regional studies in physical geography should also describe man's action upon nature and the transformation of the natural landscapes under the influence of man's productive activity. Such analysis is often ignored by the authors of the books under discussion.

It is desirable that the influence of man on nature be shown not merely in the form of any single paragraph devoted to this problem. The whole study should be permeated with an analysis of this problem, based on a reconstruction of the conditions that man probably encountered at the dawn of historic development.

Another essential requisite in such monographs is a regional survey closely integrated with the adopted system of regionalization. This gives rise to a number of serious and unresolved questions in view of the absence of a generally accepted system of natural regionalization. For the time being there will apparently have to be subjective judgment in any system. This is because we still dispose of an inadequate amount and knowledge of factual data, and not because the categories of natural regions are inherently subjective.

We can now proceed to the problem of organization of regional monographs in physical geography. These studies must open with an introductory section containing information about the history of exploration of the region, its geographic location and its place names. The last item is especially interesting in national minority regions, where the origin and meaning of place names are unfamiliar to the Russian reader.

This is followed by the general part, which should contain a characterization of the natural conditions of the regions with sections on climate, geomorphology, soils, vegetation, etc. This vital part should reveal general laws in the character of the natural conditions of the study region and in their geographic distribution.

The third part of the monograph would be regional, with a presentation of the system of regionalization. The fourth part would be a reference section, with indices, bibliography, etc.

Such an organization would seem to be optimal. But it cannot always be sustained. For example, the book Lesostep' i step' Russkoy ravniny has no introductory part. It contains only one chapter of such an introductory part - the history of the geographic study of the territory, which is rather well done in this case.

In the book Srednyaya Aziya we tried to follow the complete scheme. However, it is still too early to judge how successful this was.

How should the general and the regional parts differ and how should they compare in length? These questions must be solved for each individual case, depending on the complexity of the physical geography of the study area. If the territory is complex, the significance of the regional part increases. The greater the size of the territory, the more space is assigned to its regional subdivisions. If the general part discusses the general laws characterizing the individual natural elements, then the regional part should stress those aspects of integration of the natural elements that show why the given system of regions was selected in the first place.

In connection with our discussion of the organization of geographic monographs, some questions suggest themselves. Is it necessary in physical-geographic monographs to give information about population and economy? If so, along what lines? And where should such a chapter go? It seems to us that just as economic geographers quite rightly describe the natural conditions of the study area, so should we physical geographers give data on population and economy in our books. But population and economy in our monographs should play a subsidiary role; they should only orient the reader regarding the economic conditions under which man's transformation of the environment of a given territory is taking place, who inhabits this territory, and what are its main forms of economy. It seems to us(not all agree with this) that the place for these chapters is at the beginning of the book, in the introductory part.

It is very important for physical geographic monographs to explain the practical significance of given natural phenomena or processes, i.e., to establish links with economic geography. For example, a discussion of the climate of Siberia or the water resources of Central Asia should be related to agriculture. This makes the description of the natural conditions concrete and purposeful.

Can it be said that the ratio between general physical geography and regional description should be constant and rigid? We are against such rigidity because the geographic individuality of a territory does not permit drawing of an identical line in each case.

A few methodological questions. How should regional studies in physical geography be written? Here a number of difficulties arise. The large monographs by the Institute of Geography of the Academy of Sciences of the USSR have been written by groups of authors. *Srednyaya Aziya* was written by fifteen authors, *Lesostep' i step' Russkoy ravniny* by seven. Arguments are brought up for and against a group approach to the writing of monographs.

When a large number of authors are involved, greater depth is obtained in the development of the subject because each author is a specialist on a particular section of the book. If there are few authors, the required depth is, as a rule, no longer obtained in a number of sections. On the other hand, with a large group it is hard to link the separate parts of the book together, and sometimes it is even impossible to eliminate discrepancies. The tying together of chapters written by different authors is a complicated task. The editor is not always successful in achieving full coherence of the material in the book to make it a single monograph with single conclusions.

There are three methods of writing such books: (l) the group method, where the depth of the scientific content of the individual sections of the book is substantially increased, but at the expense of the unity of the material; (2) the individual method, where everything is written according to the author's own plan, the material is firmly bound together, but the work is more superficial, and (3) the limited group method, involving small groups of authors, where one author assumes responsibility for, let us say, biogeography, another for geology, geomorphology and, perhaps, hydrology, and so forth. It is usually easier for such a small group to work together and to arrive at agreed scientific conclusions.

A standard program has been worked out for the publication of regional geographic studies in the Institute of Geography of the Academy of Sciences of the USSR. Like any other program, it undergoes changes in the process of work on a given monograph. This raises the question whether all authors must adhere inflexibly to all the points in the publication program? I would answer this question in the negative, because, on the one hand, we should not disregard the individuality of an author or a group of authors, and, on the other hand, we should not disregard the nature of the given study area. Therefore, freedom of action should be preserved to a certain degree without endangering the objective of creating studies of a uniform type.

The next methodological question deals with the degree of popular appeal that is to be given such geographic monographs. There is no doubt that books on the geography of the USSR with different degrees of popular appeal are needed. The Institute of Geography of the Academy of Sciences of the USSR issues, in the main, scientific monographs of a regional character, but this does not mean that they are designed for a narrow circle of specialists. For example, a climatologist or hydrologist who is studying a given territory would also consult a regional study, while going to specialized sources for his basic data. We cannot provide for all specialized scientific interest, but our aim in producing regional monographs should be to satisfy the demands of a wide range of specialists, who will go to such monographs for brief descriptions of the complex of natural conditions of a given territory, and characterizations of the general and specific laws inherent in them. This requires a combination of scientific presentation and simplicity of language. This is true of books on both economic and physical geography.

The next question is that of cooperation. Generalized studies in physical geography, such as the large monographs, should be prepared in cooperation with scientific workers in the provinces. The Institute of Geography of the Academy of Sciences of the USSR has engaged a number of specialists on Western Siberia, the Far East, and Central Asia for this work. This practice must be further developed because it is precisely such cooperation with the local experts that will make it possible to compile the twelve large books on the physical geography of the USSR in the next few years. This is entirely possible under conditions of joint and coordinated work.

References

1. The text of a report read to the coordinating conference at the Institute of Geography of the Academy of Sciences of the USSR on the problem of the "Geography of the USSR".

2. The Institute of Geography has published thirteen books of this series on the following regions: the European North, the Soviet Arctic, the Lower Volga Region, the Middle Volga Region, the Lower Don and North Caucasus, the Northwest of the RSFSR, the Central-Chernozem Region, Western Siberia, Central Asia, the Far East, the Kuril Islands, Kazakhstan, and the Moscow Region. A book on Kamchatka is in press.

ON THE COURSES OF DEVELOPMENT AND THE NEXT TASKS OF GEOMORPHOLOGY

By Ya. D. Zekkel'

(From Izvestiya Vsesoyuznogo geograficheskogo obshchestva, 1958, No. 6, Pages 534-6).

1. The idea that all relief-forming factors can be subdivided by origin into two large groups, endogenic and exogenic, has been current ever since geomorphologists have begun thinking about the origin of relief.

They still adhere to that idea. However, the significance ascribed to each of these groups has changed substantially, and this circumstance has determined the main stages of evolution of our science.

The conflict of opinions here is essentially a continuation, though in a considerably modernized form, of the old dispute between the plutonists and the neptunists. Hence, supporters of the predominant role of endogenic processes might be called neo-plutonists, and the followers of the opposing school, neo-neptunists.

2. In the history of geomorphic ideas, three basic stages may be discerned. They are evident especially clearly in the evolution of the views regarding the origin of the relief of plains, with which the present article is mainly concerned.

In the course of the first stage, from the middle of the last to the beginning of the present century, i.e., before the development of geomorphology as an independent science, questions of the origin of relief were dwelt upon only casually, in conjunction with other geologic problems. Studies specially devoted to relief were rare. The attention of authors was attracted chiefly by major forms. Both geologists (18, 20) and geographers (1) assigned the dominant role to tectonics.

The second period, from the beginning of the present century to the forties, was characterized by the emergence of geomorphology as a separate discipline. Special courses were offered in higher educational institutions and many studies were published not only on individual regions, but also in the form of generalizations. These studies were concerned with the study of small and medium-size forms. A clearly dominant role was assigned to the denudational and accumulative activity of rivers, glaciers, the wind and, in general, to external agents (10, 28, 30).

During the third period, which began with the 1940's and is still going on, there was further growth in geomorphic research. In addition to the study of small and medium-size forms of relief, attention was paid to the study of larger forms as well, not only on land, but also on the sea bottom.

The chief role in the formation of structures was assigned to endogenic processes (6, 13, 15). There was a tendency to cite a multitude of examples of the way tectonic structures are reflected in the present-day relief (2, 7, 9, 12, 14), with increasing attention given to the distribution of drainage systems and the configuration of the watersheds. Considerable space is now being devoted to comparative studies of hypsometric, geologic, structural and other maps (9, 14, 15). At the same time, the school of neo-neptunists continues to develop (21, 27). Attempts to unite the two trends are unfortunately rare (17).

3. The clash of opinions between supporters of the predominant role of, on the one hand, internal and, on the other, external forces is aggravated by the long-standing fight over geomorphology between geographers and geologists.

The establishment of our science as an independent branch of knowledge (4, 19, 26) coincided with the development of greater interest in Quaternary deposits (11, 23, 29, 31). Both disciplines were promoted and taught predominantly in departments of geography. For this reason, there is still a tendency to equate the geomorphologist with the specialist in Quaternary deposits). This undoubtedly led to the fact that the causes of the formation of relief were sought mainly in processes that took place in the Quaternary period. And since the idea of the tectonic "tranquility" of the Russian Plain in the Post-Pliocene prevailed in the beginning of the 1930's (24), it was natural that the origin of its relief was attributed almost entirely to exogenic factors.

And the study of these factors, like research in geomorphology and Quaternary geology, was considered the prerogative of geographers.

This view was jealously defended in an effort to prove that geomorphology belonged to the geographic sphere of knowledge. Attempts to advance endogenic forces -- and especially ancient forces-- to first place were regarded as an encroachment by geology and given a negative reception.

4. Some persons distinguish a geologic-geomorphic trend insisting on the endogenic factors of relief formation, and a geographic-geomorphic trend giving priority to exogenic processes (9).

Such a contrast is unfounded because both factors must be regarded either as geologic, if they are considered as the agents that have created the earth's crust, or as geographic, if their influence on the present landscape is of primary interest.

In our view, geomorphology is unitary and, in spite of the fact that it constantly resorts to geologic data, it is a geographic science because it studies one of the components of the geographic landscape - the present surface structure (21).

Paleogeomorphology, which investigates buried relief that is not reflected in the present surface of the earth and is not undergoing evolution, is another matter. It is a part of paleogeography and belongs to the sphere of geologic sciences, although it constantly resorts to geomorphic data (16).

5. Lately the role of tectonics has been appraised at its true worth by many authors. This is shown not only by numerous articles examining separate regions from this point of view, but also by a number of studies of a summary character (6, 9, 15, 22). At the same time, this view is entirely ignored in other regional studies and in certain generalized studies (21, 27).

Thus, we find an undesirable tendency toward independent development of both of these schools of thought. The chief trouble is no longer an underestimation of the endogenic factors, as was the case until quite recently, but in the parallelism of the two schools. I believe that here, as in all kinds of stratigraphic disputes, maps will play a beneficial role. Mapping requirements cannot be reconciled with the situation that has been created. A map needs a single legend and consequently a single approach to the question.

6. Study of the deep-seated geology of the regions of the Soviet Union, and primarily of the Russian Platform, in the post-war years has furnished the data that gave rise to the ideas about the prime significance of internal forces in the formation of continental relief. The extensive oceanographic work done in recent years played a similar role in the interpretation of the origin of sea-bottom relief.

Recent progress of geomorphology is thus due in considerable degree to new data drawn from adjacent sciences.

Nor does geomorphology "remain in debt". It has already shown what great influence the underwater relief has on the ice regime of the Arctic basins and on the distribution of marine organisms, particularly commercial marine animals. On the other hand, geomorphic analysis of the connection between structures and surface relief makes it possible to uncover tectonic disturbances (2, 9, 12, 14), which often play a determining role in the distribution of various minerals, notably petroleum.

The promotion of the interrelationships between geomorphology and adjacent sciences is therefore a second urgent task.

7. Each of the components of a geographic landscape bears traits inherited from past periods, but the degree of this relationship varies substantially. Climatic factors, for example, are much more subject to change than the plant cover. Relief undoubtedly is the most archaic in character, but its various forms are also far from being alike in this respect. For example, dunes, gullies, most river terraces and many beach shore ridges are relatively recent. Large lowlands and plateaus are found to be considerably older .Of still older origin are drainage systems , not only in their overall features, but sometimes even in details. For example,many hill ranges of the Russian Platform, although low in elevation, are sharply defined in the vicinity of rivers, which usually are diverted into large bends at their intersection.

It should be added that the location of such apparently recent forms as terminal moraines or the shore terraces of Quaternary basins is often determined by the tectonic relief (15).

Finally, it should not be forgotten that the most recent crustal movements, which are, of course, a powerful factor of relief formation, have usually been in turn inherited from older tectonics (25)

All this should induce us in geomorphic analyses not to confine ourselves to the most immediate, relatively recent causes of the existence of a given form, but to try to seek out the older causes.

This I regard as the third task confronting geomorphology.

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THE RESULTS AND TASKS OF STUDIES IN REGIONAL ECONOMIC GEOGRAPHY AT THE INSTITUTE OF GEOGRAPHY OF THE ACADEMY OF SCIENCES OF THE USSR (1)

By S. N. Ryazantsev

(From Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1957, No. 5, Pages 56 - 61).

One of the principal functions of the Institute of Geography of the Academy of Sciences of the USSR is the preparation and publication of monographs on the economic geography of regions of the USSR. These monographs are based on the existing literature and pertinent field data and designed to cover the entire territory of the country to make up a "Geography of the USSR" (2).

The work on this series is being done by the Institute in cooperation with the academies of sciences of the union republics and the branches of the Academy of Sciences of the USSR. The program began on a broad basis at the beginning of 1946. Since 1950 steps have been taken to publish the monographs on a systematic basis.

In the last six years, the Institute of Geography in conjunction with the academies of sciences of the union republics has issued eleven books. Four studies are in press and exploratory work is being carried out on a number of large regions. Three monographs of this series have been issued in the provinces. The are Latviyskaya SSR, Belorusskaya SSR, and Uzbekskaya SSR.

There has thus been a definite upturn in the compilation and publication of regional monographs in economic geography. But much remains to be done. We still have no publication similar to the pre-Revolutionary work Rossiya (Russia) by P. P. Semenov-Tyan'-Shanskiy. Nor do we have comprehensive geographic monographs such as have been published abroad.

The lag of Soviet geographers in the publication of books on the geography of the USSR is not in accord with the demands that confront geographic science. Let us recall the resolutions of the plenary meetings of the Central Committee of the Communist party that preceded the 20th party congress, the resolutions of the congress itself and of the plenary meetings after the congress. All these resolutions stress the need for raising the quality of economic planning by taking account of the natural and economic characteristics of regions. But if we are to take due account of these characteristics, we must know them, and for this we must study and explore them. The study of these characteristics is one of the tasks of geography. Which science, if not geography, can make the greatest contribution in this field and provide the research needed to interpret the natural and economic conditions of regions and the characteristics of the economic occupations of the population? The development of regional studies in economic geography of the USSR will help to solve this task.

The significance of integrated regional studies in economic geography has been growing since the administration of industry and construction has been placed under regional economic councils.

These developments heighten the significance of research work on the economic geography of the regions of the USSR, and point out the clear path of development for Soviet geographic science. The significance of these regional studies is growing in conjunction with the problem of the economic regionalization of the USSR, and in conjunction with the expansion of international cultural ties.

It should be recalled that Academician I. P. Gerasimov's main report to the Second Congress of the Geographical Society of the USSR noted that "shortage of serious scientific generalizations on the physical and economic geography of the USSR weakens the authority of the profession, reduces the effectiveness of its contributions to the nation's economic development and impedes the development of the theory of Soviet geography. It is obvious that theory can be elaborated only on the basis of analyses and generalizations of diverse factual data; without such a basis, theoretical research remains abstract, forced, fruitless and divorced from life and reality."

In view of all these circumstances it seems to me that regional studies on the geography of the USSR should be at the center of attention of Soviet geographers.

What then is the status of these studies? How do things stand with respect to the preparation and publication of a series of integrated regional economic-geographic monographs on the USSR?

Work on the publication of these monographs has been carried on since 1951 by the Institute of Geography of the Academy of Sciences of the USSR in cooperation with the geographers of the academies of sciences of the union republics. Staff members enlisted in this project include persons from the academies of sciences of the Georgian, Armenian, Azerbaydzhan, Lithuanian, Estonia, Tadzhik and Uzbek SSR's, the Karelian Autonomous Republic, the Moldavian and East Siberian branches of the Academy of Sciences of the USSR; the Academy of Sciences of the Kazakh SSR and the Komi branch of the Academy of Sciences of the USSR. In addition, geographers from Leningrad and the provinces are also involved. The Institute has also been in touch with work in the Latvian SSR and the Belorussian SSR (3).

The total number of participants is 200, of whom 100 are authors. As a result of their work, a series of books is being prepared on the regional economic geography of the USSR.

This series is finally making its appearance after long delay. No similar series of regional studies appeared in Soviet economic-geographic literature in the Thirties and Forties. This circumstance was a great flaw in the development of economic geography as a science.

What success, then, has been attained in producing a unified series of books on the regional economic geography of the USSR?

All the books of this series have one common aim: to depict the contemporary economic geography of the USSR, as it has been constituted during the years of Soviet rule; to characterize the main results attained in the developement of the economy of the union republics and the economic regions of the RSFSR; to reveal the shifts in the distribution of the economy; and to show differences in the natural and economic conditions within the regions of our country.

All the books of the series are based not only on published material, but also on field data. All are original scientific works in terms of their factual data; all are also concerned with analysis and not just description. The books are designed as characterizations of specific regions, stressing not merely the inventorying of the facts and phenomena, but selecting and analyzing them to bring out the typical economic-geographic characteristics of the region on a given scale of investigation. The books try to achieve a unity and logical coherence of their separate parts.

Manifest in one way or another in all these studies are the geographic approach to the phenomena studied; the aim of revealing the causes of the distribution of the described phenomena, the analysis of the natural geographic environment with its economic evaluation; the historic approach to regional description; the clarification of areal economic differences and economic geographic regionalization; the attention to cities; the emphasis on the map; and, finally, the long-range view , combining analysis with conclusions about possible new ways of economic development of the region or parts of it.

All the studies include a general and a regional part, with the regional part predominating. But this principle should not be regarded as dogma. Much depends on the character of the region and on other circumstances.

The published studies in the series include books in which more than 50 per cent is assigned to the regional part. These are *Kirgiziya*, *Armeniya*, *Gruziya* (Georgia), *Zapadnaya Sibir'* (Western Siberia) and *Belorusskaya SSR*. In other books the general and the regional part are equal in size. These are *Turkmeniya*, *Litva*, (Lithuania) and *Estoniya*. Finally, there are books in which less than 50 per cent of the volume is given over to regions. Such are *Kareliya*, *Moldaviya*, *Krym* (The Crimea), *Tadzhikistan* and *Latviya*.

In geographic publications of this kind, the question of the relationship between the general and the regional part is important but not decisive. The crux of the matter does not lie in the simple ratio between the two sections or their chapters, but in the substance of the analysis of the phenomena examined. This analysis should be economic-geographic, not economic-statistical or anything else. Of course, other things being equal, greater attention to the regional part always enhances the value of the books as geographic studies. It would be most advisable for the general and regional parts to be about evenly divided, or with a somewhat larger regional part.

If we try to unify the books (and this is essential in the publication of a series), the question arises how their size is to be planned to insure relatively similar treatment of the amount of detail. In the books published thus far, strict proportions were not observed. Some are treated in greater, others in lesser detail. As a rule, the non-Russian union republics are treated in more detail than regions of the RSFSR that are equal or greater in size.

Also important is the question of what criteria should be followed in distributing the total amount of space among economic regions within a republic. How much space is to be assigned to the Urals, Western Siberia, for the regions of the Center, etc.? All these regions differ in their degree of economic saturation and complexity. Evidently, we cannot confine ourselves to a single index, but must consider an aggregate of indices. These should include numbers and density of the population, and the number of cities and of the industrial centers in general.

The joint effort of the Institute of Geography of the Academy of Sciences of the USSR and of the academies of sciences of the union republics has undoubtedly stimulated similar projects in the provinces. This is evident from the appearance of similar books on the Belorussian SSR, the Latvian SSR, the Uzbek SSR and the Ukrainian SSR. In the last five years many local economic geographic studies devoted to small areas, chiefly oblasts, have appeared. These local studies include: Frunzenskaya oblast' (by Kartavov), Karagandinskaya oblast' (by Konobritskaya), Namanganskaya oblast' (by Akramov), Novosibirskaya oblast' (by Protopopov) and Nizhniy Don (by Gozulov).

What are the next objectives in the work on regional economic-geographic books on the USSR?

Evidently, the first is the completion of the studies under the present plan covering all the republics and regions of the USSR, getting them ready for publication and improving the new issues by comparison with the previous ones. The following issues must be prepared for the press: The Urals, Eastern Siberia, the regions of the Center, the Uzbek SSR, the European North and the Northwest. This must be done by 1960. We must also carry out work on the Far East and the Ukrainian SSR. The present plan is to have the book on the Ukrainian SSR done in the Ukraine.

The second task, which may be tackled even before the completion of the first, calls for a second edition or rather a revision of the whole series within a brief span of time to preserve comparability of data between volumes. Such a revision should try to improve the manuscripts in every way possible. How is this to be done?

First of all, there must be constant concern for the level of scholarship.

The publication of the series of books on the economic geography of the USSR has been drawn out over a long span of time. The more recent books have been improved compared with earlier ones, in a number of cases quite thoroughly. Nonetheless, their scholarly level can still not be considered satisfactory and must be raised in every way possible.

Our progress thus far is very small compared with what should be done to produce a fine series of economic-geographic monographs on the Soviet Union.

What, then, are the chief ways of raising the scholarly level of these books?

Above all, their research aspect must be strengthened. The monographs are sometimes based almost entirely on published literature or statistical data.

In their studies of a number of foreign countries, Soviet economic geographers are often obliged to rely entirely on the literature and published statistical data, without ever having visited the country under study. The analysis and conclusions in such studies are based on published data only. Such an approach cannot be ignored in geography, especially when it is the only possible one. In this connection it would be fitting to recall the statement by P. P. Semenov-Tyan'-Shanskiy about the value of so-called compendiums (4).

However, geographic work on the regions of the USSR should be handled differently. The books should be based not only on published material but on factual research data gathered by the geographer himself with the object of producing a newer and more thorough geographic analytical description of the study area. This is precisely one of the ways of strengthening the research character of geographic monographs. The monographs should, so far as possible, rest on original research. This must be stressed because we can have no other approach to the economic geography of the USSR. Whatever the region studied, we will not find in the published sources all the data needed for a full treatment and will have to turn to original sources, to the collection of primary materials and their analysis. This points up the inadequacy not only of the economic-geographic, but also of the purely economic literature on the branches of the economy and on the regions of the USSR.

We must then try to use new statistical data to raise the level of the studies through broader inclusion and utilization of the pertinent data.

Thus, as our first objective, we should improve the scholarly content and analytic character of the monographs through broader research and greater utilization and analysis of statistical data.

In order to raise the scholarly level of the monographs, we must increase their problematical content and raise their theoretical level.

When an economic geographer or group of geographers study a region, their objective is always to delve deeply into the region's economic life and, through an analysis of the geography of the population and economy, to draw conclusions not only of scientific, but also of practical, significance. These conclusions may concern various problems, such as new ways of economic utilization of the resources of the region, of improving the distribution of the industry, agriculture and transportation, or of eliminating a lack of balance in economic development; general hypotheses of the future development of the region's productive forces on the basis of local conditions; or various specific proposals on particular questions with a view to obtaining certain economic advantages. Such an approach is one of the ways of heightening the scientific and practical value of the regional studies.

While making this integrated study of the region, the geographer also notes the historical factors in the distribution of the economy for their possible relevance to general or particular scientific questions. The research geographer also has opportunities for working out a typology or economic-geographic phenomena, such as population centers and types of population distribution, for the purpose of delimiting economic regions at various scales.

Many useful conclusions in an integrated regional study can also be reached in the field of historical geography. All this helps to raise the theoretical level of the monographs and contributes to the theory of the various branches of geography.

We must not lose sight of the fact that while regional studies are eminently suited to the "problem" approach, they also have their own inner logic and cannot absorb all the problems of economic geography. Much must be left for problem studies of another character, having different aims and organization, as well as for articles in scientific journals dealing with more limited themes.

The scholarly level of monographs can also be raised through greater attention to their integrated character.

One of the characteristic aspects of the published studies is the close connection between physical and economic geography. However, the space given to physical geography and to an economic analysis of the natural conditions and resources is still inadequate and requires strengthening. We must reach the point where the writing of major regional monographs will be a joint effort of both economic and physical geographers.

The realization of all these measures will undoubtedly raise the scholarly quality of the studies in regional economic geography and bring them to a higher scientific level in the second round of publication.

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1. Abridged text of a report read before the coordinating conference at the Institute of Geography of the Academy of Sciences of the USSR on the problem of the "Geography of the USSR."
2. Let us recall the background of this project. The question of the "Geography of the USSR" was first discussed at the first Soviet Geographical Congress in 1933, at which N. N. Baranskiy's report was devoted to this question. In 1936-37 a main Editorial Office for a "Geography of the USSR" was established at the Academy of Sciences of the USSR and N. N. Baranskiy published a plan for the region-by-region volumes of the "Geography of the USSR". In 1937 the project passed to the Institute of Geography of the Academy of Sciences of the USSR, but it was not pursued any further before the war. It was resumed only in 1946, when the compilation of a series of books on the "Geography of the USSR" was recognized as one of the main tasks of the institute.
3. Thus far eleven monographs have been published on the following areas: Kirghizia (1951), Turkmen SSR (1954), Crimea (1954), Moldavian SSR (1955), Lithuanian SSR (1955), Armenian SSR (1955), Estonian SSR (1955), Georgian SSR (1956), Western Siberia (1956), Karelian ASSR (1956), Tadzhik SSR (1956). Four monographs (Volga Region, North Caucasus, Azerbaydzhan, and Kazakhstan) are in press, and work is proceeding on six more monographs (Urals, the regions of the Center, Eastern Siberia, European North, Northwest and Uzbekistan).

4. See the review by P. P. Semenov of K. Tserenner's "Regional Description of Perm' Guberniya as material for a closer knowledge of Russia," 2nd part of Vestnik RGO, 1953.

THE ZONAL CHARACTER OF THE COLD POLE

By Yu. P. Parmuzin

(From Izvestiya Vsesoyuznogo geograficheskogo obshchestva, 1958, No.5, Pages 472-474).

The concept of a cold pole of the Northern Hemisphere in northeastern Siberia is widespread in popular and educational literature.

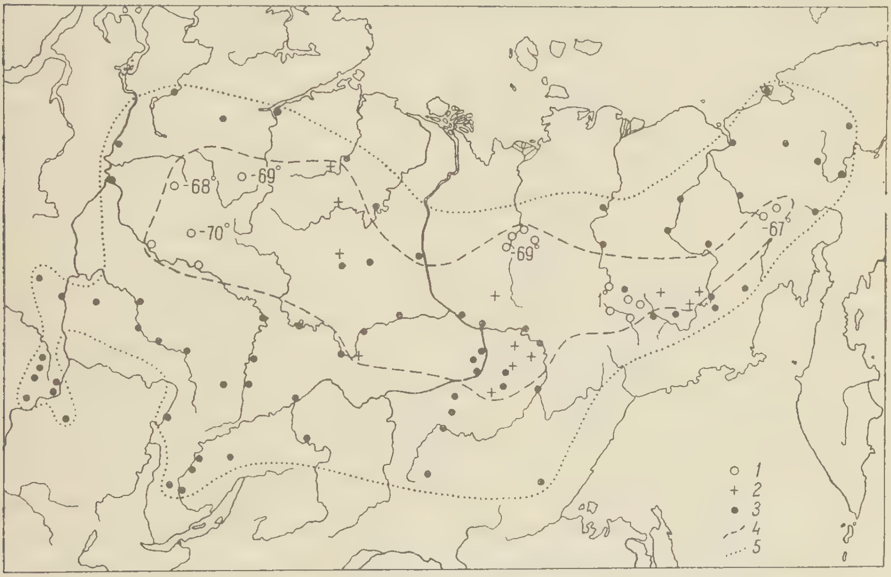
The idea of the coldest spot on earth first appeared after a low temperature of -67.6 °C was registered at the weather station of Verkhoyansk in February, 1892. Later, temperatures below -60° and even as low as -67° were repeatedly recorded there in January and February. At that time, there were few weather stations near the Arctic Circle in Siberia. No air temperatures below -67° were observed and Verkhoyansk was considered the cold pole for almost forty years.

An explanation of this phenomenon was not hard to find. Verkhoyansk is situated in the high latitudes of the world's largest continental mass, in an intermontane basin open toward the north and in an area dominated by a winter high and temperature inversions. The air thus stagnates and becomes supercooled, giving rise to a cold pole.

However, many places can be found in Siberia having similar conditions favoring the supercooling of air. And, indeed, with the expansion of weather stations in the 1930's an even colder place was discovered at Oymyakon, where air temperatures of -70 and even -71° were recorded. The cold pole thus "migrated" to Oymyakon.

With the further expansion of weather stations, places with absolute temperature minima close to those of Verkhoyansk and Oymyakon began to appear. More than a hundred points where temperatures of -60° and lower have been recorded are now known in the Northern Hemisphere. Such points are situated chiefly in Eastern Siberia and in the area dominated by the Siberian high (see figure). But if we take only those places where minimum temperatures of -67° and lower have been recorded, i.e., as in the first "cold pole," these are located east of the Yenisey, between 93° 30' and 160°30' E. and in a belt between 63°30' and 68° 30' N. Thus far there are not many, but obviously more will appear as the area is better studied.

The stations are Agata in the Putorana Mountains (66° 53'N. 93° 30'E., elev. 293m), with an absolute minimum of -68°; Kochumdek, in the valley of the Nizhnyaya Tunguska River (64°23' N. 94° 07'E. elev. 110 m), with -68°; Tembenchi, in the valley of the Tembenchi River with -70°; Tura, in the valley of the Nizhnyaya Tunguska River (64° 10'N. long. 100° 00' E., elev. 130m), with -68°; Yessey, in a lake basin (68° 28'N. 102° 22' E., elev. 200 m), with -69°. East of the Lena, a number of points with low temperatures lie in the Verkhoyansk basin; Ekyuchyu (66°46'N. 131°46'E. elev. 199 m), with -69°; Verkhoyansk, (67° 33' N. 133°23' E. elev. 137 m), with -68°; Stolby (67° 31' N. elev. 120m), with -68°; Kumakh (67° 35' N. elev. 157 m), with -67°. Well known for their low temperatures in the Oymyakon Plateau are: Oymyakon with an air temperature of -71° (2 m above the ground), recorded a single time; Artyk (64°12'N 147°10'E., elev. 800 m), with -70°; Delyankir (63°50' N. 145°37' E., elev. 802 m), with -68° to 70°; Nera (64°34'N. 143° 14'E., elev. 489 m), with -68°; Ust'-Moma (66°27'N. 143°14' E., elev. 160m), with -67°. Finally, in the valley of the Omolon River, a temperature of -67° has been recorded at two places.



The cold zone of Eastern Siberia

1. Recorded absolute air-temperature minima of -67° to -71°; 2. -65° to -66°; 3. -60° to -64°; 4. Boundary of the cold zone with the lowest temperatures in the Northern Hemisphere; 5. Boundary of the area with a high-pressure system, in which winter air temperatures drop to -60° and lower.

Thus, if we take into account only the absolute minima of temperatures, we can already speak, not of a cold pole, but of a "cold zone" even on the basis of incomplete data.

A zone of absolute minimum temperatures in the Northern Hemisphere conforms considerably more to what may logically be expected from a climatic and physical geographic viewpoint than a single area or point, as was previously conceived. We thus deal no longer with a single abnormal point produced by a combination of circumstances, but with a zone based entirely on the law of geographic zonality in which the lowest absolute air-temperature minima probably occur.

This zone exists primarily because of its continental location. It is dominated by a stable high-pressure system in winter. It is generally known that the air near the ground in Eastern Siberia is excessively chilled because of calm weather and insignificant cloudiness. The chilling reaches a maximum in those high-pressure areas where reradiation prevails, i.e., which have a polar night of many weeks' duration, twilight or winter day with the sun remaining just above the horizon. The combination of a high-pressure system and a reradiation regime in the high latitudes causes the appearance of a zone of minimum temperatures. Hence, it is no accident that absolute minimum temperatures are recorded farther north, where the continent penetrates farthest northward (Yessey), swinging southward together with the recession of the coastline of the Arctic Ocean toward the south, as well as in areas beyond the reach of the cyclonic influence of the Atlantic.

There are fewer absolute minimums north of 67°N because average winter temperatures rise as cyclonic activity increases and weakens the effect of the high.

Relief also plays a role in the lowering of the temperature. It is obvious that in intermontane basins the conditions for a more frequent and intense chilling of air are more favorable than in exposed localities. Thus far, the lowest temperatures have been recorded in the intermontane basins of northeastern Siberia and in the area of the Putorana Mountains. In the lower lying areas within the "cold zone", for example, in the basin of the Anabar and Olenek Rivers, no temperatures below -66°have thus far been recorded. And in the sub-Arctic part of the Lena valley temperatures have not fallen below -64°. However, observations have been conducted over too short a period to rule out the possibility of lower temperatures. At any rate indications are that the distribution of places with the lowest temperatures is independent of relief if other conditions are equal. The relief only favors a greater drop in the temperatures; it does not cause that drop.

It should also be borne in mind that in the eastern part of Siberia, in the central Yakut lowland and beyond the Verkhoyansk Range, the continentality of climate is most pronounced. The winter high-pressure system reaches its maximum. Hence, the recurrence of absolute minima is observed more often here than in the western areas. At some points in the central Yakut lowland, temperatures of -65° have been recorded, although these points lie south of 63° N. This may be explained precisely by the key role of continentality and by the maximum effect of the high-pressure system, which creates tempe ature conditions close to those of the sub-Arctic zone. Nevertheless, the lowes temperatures develop as a result of the concurrent action of the high-pressure system and reradiation conditions.

AN EXPERIMENT IN THE ECONOMIC-GEOGRAPHIC STUDY OF THE CITIES OF THE USSR

By M. I. Pomus

(From Izvestiya Akademii Nauk SSR, Seriya geograficheskaya, 1958, No. 1, Pages 129 - 133).

During World War II the Institute of Geography of the Academy of Sciences of the USSR produced economic-geographic studies of a number of cities and some other population centers in the eastern regions of the USSR, especially in Kazakhstan, Northern Kirghizia and the southwestern part of Western Siberia (1).

In spite of shortcomings caused by the circumstances under which it was conducted, this work is of considerable methodological and practical value and can be utilized in similar research.

Unlike the usual economic-geographic urban studies of the regional type, this work treated cities primarily as industrial and economic centers mobilizing the natural and economic resources of their tributary regions. In stressing this approach, priority was given to an analysis of the industry of the city and its economic links as well as to the natural and economic resources of the tributary area. The research was not confined to a "static" characterization of the existing industrial-economic aspect of the cities and its productive relations. It was also concerned with the prospects of further industrial development. In fact the consideration of future development played a key role in the research. Moreover, research on prospects of development was not confined to general considerations about the possible courses of industrial development of the given city, as is usually the case. Such general considerations are all right for teaching purposes or as a first outline for further research, but they can rarely be utilized directly in actual economic planning. A detailed and well-grounded study of the possibilities of economic, and particularly industrial, development is, in our opinion, one of the most important tasks of economic geography in the USSR. The objective must be not only a correct description and explanation of the various phenomena, but also the formulation of measures that could change the nature of these phenomena in a desired direction.

This objective led to the choice, for investigation, not only of cities but also of other population centers that might ultimately be industrialized and, because of their economic-geographic location and the combination of natural and economic resources of their tributary areas, become cities. Thus, it was a matter not only of existing, but also of potential cities, and a number of small population centers, hardly more than rural settlements, were regarded as future cities in this investigation.

At the same time, these studies showed that a number of other population centers, including some cities, though situated favorably with respect to transportation and raw-material(mainly agricultural) resources, did not have the foundations for major industrial development. This was either because of a problem of water, fuel, or building-material supplies (as in the Ishim and Baraba steppes or in some parts of Kazakhstan) or because of their location near points possessing more advantageous conditions for industrial development (2).

During the study it became clear that the industrial potential of cities and other centers should be examined against the background of the integrated economic -geographic region on whose territory the center under investigation was situated.

The potentialities of industrial development of a given city cannot be properly examined in isolation, without regard to the potentialities of industrial development of other population centers situated in the same economic area. Only if this is done, can the researcher define the lines of potential industrial development of the given city and sketch out its likely pattern of industrial growth. In the course of the wartime studies it was usually possible to investigate a given city against the background of a previously delimited economic tributary area with known characteristics. However, in some cases, notably in the southwestern part of Western Siberia, the researchers encountered "virgin territory" and were obliged first to delimit economic tributary areas within the basic economic region. This examination of the urban centers against the background of the economic tributary areas is not reflected in all the urban studies, but in one way or another it was considered in the analysis of industrial development. In addition to the southwestern part of Western Siberia, this applies also to the studies of Frunze, Alma-Ata, the population centers of the Issyk-Kul' basin and the Kuznetsk Basin.

The investigation showed at the same time that each of the existing or potential industrial cities was linked to some degree by economic ties (raw materials, fuel, sales of produce), with a definite tributary area. These ties sometimes extended in a great variety of directions, depending on the specific conditions, and, in the last analysis, marked the limits of the "region of economic influence" of the given city.

Sometimes the region of economic influence coincided in general with the integrated intra-oblast (lower-level) economic-geographic region, especially when the given city was the only industrial center of this region, but well developed economic-geographic regions usually consisted of several "regions of industrial-economic influence"of industrially developed population centers.

Thus, the economic-geographic region of the Lower Tobol valley was found to be divided into three "regions of industrial-economic influence," one of which (the lower course of the Tobol with adjoining part of the Irtysh valley) was centered at Tobol'sk; the second (the area between the Iset', Tura and Tavda rivers), at Tyumen'; and the third (the southeastern part of the Lower Tobol valley) was economically linked mainly with Yalutorovsk and part with Zavodoukovskiy. The Issyk-Kul' basin was similarly broken down into a western part, centered at Rybach'ye , and an eastern part, now linked or soon to be linked with Przheval'sk, Dzhargalan and other centers.

At the same time, the investigation brought out that the boundaries of the "region of economic influence" of an industrial point went, sometimes rather far, beyond the limits of the given intra-oblast economic-geographic region (usually only in certain sectors of economic activity).

The regions of economic influence of different centers may also overlap. The investigations showed that in such cases the attractive force of a given city depended on the type of commodity. For example, the upper part of the Talas valley is tributary to Frunze in farm products and to Dzhambul or Chimkent in chemical raw materials. A similar phenomenon was observed with respect to Yalutorovsk and Zavodoukovskiy, with farm products moving toward the former and lumber toward the latter.

The wartime studies also showed that a more limited tributary area had to be distinguished within a region of economic influence of a given industrial center, especially if the regional economy was of a highly diversified and ramified character. Such a limited tributary area would be one that gravitated in almost all economic channels and in its entirety toward the urban center, with which it would be directly linked by a local transportation network, consisting usually of highways and sometimes of waterways and railroads. Such an "area of direct economic gravitation" could range in size from several administrative rayons to one rayon or even part of one.

The delimitation of the size and boundaries of these two tributary areas (of "economic influence" and "direct gravitation") can be best illustrated in the case of Yalutorovsk. Its region of economic influence not only embraces five administrative rayons in the southeastern part of the Lower Tobol valley, but also extends beyond, drawing into the orbit of industrial influence of Yalutorovsk two rayons of the Ishim steppe, and extending up the middle courses of the Tobol and Iset' (within Kurgan oblast). The area of direct gravitation of Yalutorovsk is confined to three administrative rayons along the Tobol and the lower Iset'. A similar picture exists at Frunze, whose region of economic influence includes not only the Chu Valley (the area of direct gravitation), but also the upper Talas, the Issyk-kul' basin and Tyan'-Shan Oblast.

The economic links of the urban center under investigation are not confined to the region of economic influence; they extend beyond it. The investigation of these links made up an important part of the wartime studies because the industry of cities often did not rest so much on the "local" area alone, as on more far-reaching spatial links. (In the points investigated, this was true especially with respect to fuel). But the existence of such far-reaching links does not make the distant territories part of the region of economic influence of the cities under investigation. Within regions of economic influence these links are usually more substantial and concentrated; beyond these regions they are diffused over various territories. Another difference is that a given city is an economic center, sometimes the only one, in the region of economic influence and is organically connected with the regional economy, while such interrelationships hardly ever exist with more distant territories.

In determining specific industrial prospects and making an economic choice among populated centers, particularly of the non-urban type, the wartime studies analyzed the whole economic-geographic environment in which the point under investigation was developing or might develop, especially the raw-material and power supply of the tributary areas (and sometimes even beyond). Stress was laid on the prospect of establishing at these points, on the basis of present or foreseeable tributary raw-material and power resources, major industrial enterprises benefiting the whole country or its large economic-geographic regions along the general lines of development and distribution of the industry of the USSR. Small-scale enterprises, including some that are technically quite advanced, are being established in the USSR even in population centers of a clearly non-urban type (villages), but this does not make these centers "potential" cities. We are speaking about industrial enterprises that would give the population center a distinct "industrial-urban" tone. One of the characteristic features of the studies was that, in determining industrial prospects, the investigation relied not only on official plans, but also on an independent though tentative elaboration of the industrial outlook of the given city.

The economic analysis of the raw-material and power resources was, insofar as possible, backed up by tentative estimates of the material balances of the producing establishments ("technical-economic estimates"), which provided clearer ideas of the character and quantitative scope of the industrial problems raised and of the realistic significance of the raw-material and power supply.

Considerable attention was also paid to questions regarding the urban center's location with respect to transportation. It is not just a matter of the essential elements in the present economic situation; the transport location of a given city often determines the limits of its region of economic influence. For example, Dzhambul, though situated in the southwestern corner of Dzhambul Oblast, is nevertheless the real economic center of the oblast, because it is the intersecting point of the oblast's railroad and auto routes. Furthermore, it is often the location of a population center on economical transportation routes that determines its prospects of industrial development.

Water supply is also a significant factor in industrial development. In a number of cases, the investigation showed, a lack of stable sources of water supply was a definite barrier to industrial development. Considerable attention was also focused on the general physical-geographic environment (the topography of the locality, its geologic structure, climatic factors, etc.), which also sometimes substantially influences the prospects of building large industrial structures.

In the analysis of the industrial prospects of cities from the viewpoint of their industrial specialization, attention was directed to the possibilities of making integrated use of the raw-material and power resources gravitating toward the city or being created in the process of its productive activity. This insured the most rational and economically the most efficient, and sometimes just the merely possible, utilization of natural and economic resources with the least expenditure for transportation in accordance with V. I. Lenin's instructions about the rational distribution of industry from the viewpoint of proximity to raw materials. It also insured the least amount of labor needed to pass from the processing of raw materials through the successive stages of the processing of semifinished goods down to the finished product. In this connection, attention was paid to determining production links between existing or planned branches of production and the outlook for subcontracting. Considerable space was devoted to all these questions in a number of studies, particularly those on Dzhambul, Frunze, Alma-Ata, Tyumen', the Karaganda industrial area, Stalinsk and other points.

The emphasis on investigation of the prospects of industrial development of the various towns had the result that a number of producing establishments of the same type, sometimes based on the same raw-material base, were proposed for different points. But, at the same time, though not always successfully, the studies aimed at a comparative examination of the prospects of a number of cities to determine the greatest economic effectiveness of industrial or transportation construction at any given point.

The determination of the industrial specialization of a city and its prospects of industrial development were the guiding ideas in the investigation and occupied a focal point in the work. But the study of cities and other population centers of the eastern regions of the USSR made by the Institute was not confined to this aim. Other aspects of economic geography also received attention. They included historical treatment of economic development, the characteristics of the population and its way of life (insofar as they influenced the productive activity or the economy of the city), as well as the status of municipal services and housing, and the internal geography of the cities, particularly its industrial areas and the causes of their formation.

Institute of Geography of the
Academy of Sciences of the USSR.

References

1. This work was performed under the general direction of V. F. Vasyutin.
2. This article cites some examples taken from the work under discussion, but the general analysis can be applied to many other cities and industrial centers of the country.

THE MAJOR ECONOMIC REGIONS OF BRAZIL

By V. V. Pokshishevskiy

(From Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1958, No. 4, Pages 42 - 56).

Major internal geographic differences in Brazil are connected not only with her size, but also with the diversity of the natural conditions, with the historical vicissitudes of individual territories and with the diverse characteristics of her ethnically complex population. Brazil has immense virgin forests and cities with millions of inhabitants, densely settled regions of plantations and regions of extensive cattle raising, technically modern enterprises and the gathering economy of the Indians in the depths of the jungle.

Among the many traits that determine the specific economic—geographic characteristics of the individual regions of Brazil, a decisive criterion for regionalization(despite all the importance of natural characteristics and the population) is the indices of the level and type of development of the economy, or, more precisely, the level and character of the development of capitalist relationships.

In affirming this we proceed from V. I. Lenin's attempt to delimit the economic areas of the United States in his article "New data on the laws of development of capitalism in agriculture" (I). Although this article was designed to show varying degrees of development of capitalist relationships in agriculture alone, it contains important methodological principles for a general economic regionalization of capitalist countries.

An attempt to apply this methodology to the regionalization of Brazil is all the more justified because that country suggests a number of direct analogies with the United States (territories with considerable remnants of a slave-owning economy, territories being colonized in capitalist forms, and so forth). For complete comparability with the United States, Brazil lacks regions of highly developed industrial capitalism. The most highly developed states of Brazil (headed by São Paulo) do not stand comparison with what the industrial Northeast of the United States represented even half a century ago. Nevertheless, in their role in the national economy of Brazil, the South and Southeast fulfill to a large extent the same functions as the Northeast did in the development of the United States (although the South and Southeast of Brazil also bear the imprint of continuing colonization, i.e., they "combine", as it were, the features of the industrial Northeast and the colonized West of the United States). However, large areas of Brazil have still hardly been touched by the processes of capitalist colonization.

Proceeding from this, we can distinguish four major economic zones in Brazil: I.- the former slave-holding Northeast; II. - the capitalistic South and Southeast; III. - the inner western colonization zone; IV. - a zone virtually untouched by colonization.

The author considered the present article only a first attempt to pose the question, and set himself the objectives, first, of showing that the above-named regions objectively exist as realistic "territorial units" in present-day Brazil; second, of delimiting their boundaries; third, of giving a brief characterization of them, chiefly from the viewpoint of those features that have been noted in the designations themselves. The author trusts that the present article will serve as an occasion for carrying on further discussion, in which additional data will undoubtedly be supplied.

Before trying to justify the division of Brazil into the four regions named, let us point out a number of features characteristic of Brazil as a whole. This will permit us also to understand better the regionalization scheme proposed here.

Twenty or thirty years ago Brazil could still have been characterized as a backward agrarian country delivering exclusively agricultural produce to the world market (with coffee accounting for more than two-thirds of her exports), and importing all the industrial articles that she needed for the low and primitive living standard that prevailed there.

But now such a characterization would be obsolete. Although in the international division of labor Brazil continues to act chiefly as a supplier of tropical products (coffee, cacao and fruits) and cotton, industry has also developed noticeably here (2), embracing not only the mining industry which exports iron and manganese ore, rare metals and minerals, but also manufacturing. On the other hand, foreign capital has invaded Brazil in considerable amounts. Both these processes are closely related. The foreign monopolies have seized key positions in the growing industry.

The penetration of foreign capital, while promoting the growth of a number of branches of industry in Brazil, has simultaneously fettered the development of national capitalism or has assigned it the role of a subordinate satellite. Lately, the resistance to foreign shackling has been growing more and more in Brazil on the part of the national bourgeoisie and the progressive forces of the country. Several governmental or mixed industrial companies have been created in the metallurgical, chemical and oil industries; however, the foreign monopolies, by means of financial manipulations, exert considerable influence upon these forms of organization of national capital.

In agriculture, the control by foreign capital is exercised chiefly in the sphere of mortgages and the marketing of produce; this influence is very great. While the penetration of foreign capital into industry has been accompanied by an objective development of the productive forces, the subjection of agriculture to its influence has had only a unilaterally negative character. An abnormal, parasitic commercial credit superstructure has grown up, sucking away a large part of the material values produced in agriculture to pump them into banks and marketing companies. The banks, in which foreign capital rules, and the wholesalers leave to the production sphere only a small part of the receipts, permitting production to continue only on the existing primitive level with a predominance of manual labor and without the possibility of any substantial technical improvements.

In characterizing the present-day economy of Brazil as a whole as an agrarian-industrial economy, we must point out four important features: (1) considerable coercion by foreign monopolistic capital (3), (2) general technical backwardness, especially in agriculture, (3) low wages which in turn hamper the raising of production know-how, and (4) a predominance of a few agricultural export products that preserve the key role of agriculture despite the growth of industry(all the more so because agricultural exports are needed for the payment of the imported manufactures that the country lacks). The "export economy" of Brazil makes her dependent, on the one hand, on world demand for her export products and, on the other, on weather conditions governing the harvest. Out of a total export value of 43 billion cruzeiros in 1954, coffee accounted for 57.7 per cent(5) cotton 15.8 per cent, and cacao 10.5 per cent. Wood articles provided 2 per cent (yet Brazil also imported some wood), ores and concentrates 1.9 per cent. Then followed fruits 1.7 per cent, carnauba and other kinds of vegetable wax 1.2 per cent, mate 0.9 per cent and sugar 0.9 per cent. Natural rubber furnished a little more than 0.1 per cent.

The young science of Brazilian geography has already produced a few monographs on individual regions and microregions of Brazil. They give concise, concrete characterizations of individual territories. Also valuable is the fact that Brazilian geographers frequently relate these characterizations to practical tasks of economic development (6).

However, no general studies furnishing a thorough basis for the economic division of Brazil into major regions have yet been produced. The division (into five regions) adopted by official statistics in Brazil mechanically groups the states in geographically adjacent groups: North, East, South and so forth, (Fig. 1), without taking into account significant socio-economic differences. As a result, the typical former slave-holding states of Sergipe and Bahia are united with the mining area of Minas Gerais, which is developing in purely capitalistic forms. São Paulo and the Federal District, which now constitute the focal point of the development of capitalism are, on the other hand, separated from each other. Let us note in passing that this grouping assigns to different regions states with a similar natural environment, such as Minas Gerais, Goiás and Mato Grosso, or Sergipe and Alagoas, and at the same time combines subtropical São Paulo with the "coolest" state, Rio Grande do Sul.

Hence, it is difficult to use the regional scheme officially adopted in Brazil for any generalized characterizations of the internal differences in that country. And yet the statistical information is published in a grouped form based on that division.

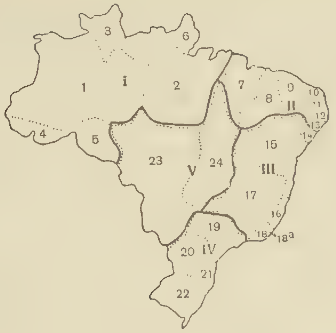


Fig. I. Regional scheme officially adopted in Brazil

- I. North
  - 1. Amazonas
  - 2. Para
  - 3. Territory of Rio Branco
  - 4. Territory of Acre
  - 5. Territory of Rondônia
  - 6. Amapá
- II. Northeast
  - 7. Maranhão
  - 8. Piauí
  - 9. Ceará
  - 10. Rio Grande do Norte
  - 11. Paraíba
  - 12. Pernambuco
  - 13. Alagoas
- III. East
  - 14. Sergipe
  - 15. Bahia
  - 16. Espírito Santo
  - 17. Minas Gerais
  - 18. Rio de Janeiro
  - 18a. Federal District
- IV. South
  - 19. São Paulo
  - 20. Paraná
  - 21. Santa Catarina
  - 22. Rio Grande do Sul
- V. Central West
  - 23. Goiás
  - 24. Mato Grosso

In 1952 the Brazilian National Council of Geography (which belongs to the Brazilian Institute of Geography and Statistics, a Government organ under the President of the Republic) made an attempt to compile a more detailed grouping of territorial subdivisions, with the intention of requiring the publication of all statistical data in terms of the contemplated units. This scheme of regionalization (published in Boletim Geográfico, September-October, 1953) has not been carried out, but it is of definite interest. The municipios (which number about 2,000) were taken as the primary units; they were grouped in "zones", fitted into the framework of the states; 227 such zones were contemplated. The zones were grouped into 81 subregions and 30 regions; zones of different states could be combined in a single subregion or a single region. The zones were distinguished according to physico-geographic features (chiefly relief, river basins and parts of basins; more rarely, vegetation associations); sometimes according to gravitation toward a big city; now and then according to economic specialization (a "metallurgical zone"comprising 19 municipios of Minas Gerais, a "cocoa zone", comprising 15 municipios of Bahia, and a few more similar "zones". The subregions and regions were also distinguished by natural features, with the accent on climate or on the location in relation to the coast.

In the "unofficial" foreign geographic literature Preston James' scheme of the basic regions of Brazil (7) enjoys great popularity. It is undoubtedly more meaningful than the "official" regionalization of Brazil. By characterizing the country according to his regional scheme, James was able to point out many substantial differences in socio-economic relationships (though he did not pursue this possibility to its conclusion or always correctly). However, his scheme exhibited the general methodological vices of James' book -- an overestimation of the significance of the problem of the interrelationships between "man and the earth" in geographic characterizations, eclecticism and not infrequently open apologism for capitalism.

In the Soviet geographic literature, there have been no attempts to regionalize Brazil since the work by I. A. Vitver. Recently, V. V. Vol'skiy and A. N. Glinkin in a small but concise book about Brazil (8) distinguished five economic-geographic regions (Fig. 2) in their characterization of its internal differences, making a number of reservations (9). They gave no special motivation for their regionalization, but in their brief characterizations of the regions themselves they rightly laid stress upon the differences in the socio-economic structure of the economy. The experiment in regionalization by V. V. Vol'skiy and A. N. Glinkin is a considerable step forward. We believe that these authors tried both to use the traditional regional scheme and to take into account economic specialization. Such an approach should be used in delimiting divisions, but is hardly justified in dividing the country into its major regions. In particular, it is wrong for such a division to separate the states of the South and Southeast, since the common feature of these states is a similar degree of capitalist development. Another defect of V. V. Vol'skiy's and A. I. Glinkin's scheme is that it only reflects inadequately the processes of colonization so important for Brazil. The names of the regions themselves (South, West, North, etc.) tell only the geographic location of each group of states.

A scientific regional scheme of Brazil should be based on grouping of parts of states rather than entire states. But most of the statistical data are published only by states. Taking into account primarily the features listed at the beginning of this article, but also density of population, distribution of the towns, the transportation network and the actual gravitation, an attempt has been made in Fig. 3 to construct a regional scheme of four basic regions. Fig. 4 shows how far this scheme can be fitted into a system of undivided states as a first approximation. The differences between Figs. 3 and 4 are not so great as may appear at first sight: they consist in the inclusion of relatively sparsely populated parts of some states in one or another region.

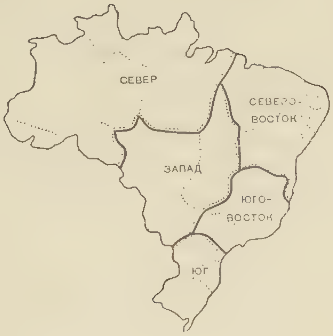


Fig. 2 Economic regions of Brazil according to V. V. Vol'skiy and A. N. Glinkin

(Words in figure: North, West, Northeast, Southeast, South).

Let us characterize briefly the basic regions of Brazil. The first, which has a direct analogy in the former slaveholding South of the United States, constituted in fact the economic core of Brazil until the 19th century. In this region of the "Former Slaveholding Northeast" (Espírito Santo, Bahia, Sergipe, Alagoas, Pernambuco, Paraíba, Rio Grande do Norte, Ceará, Piauí, Maranhão and Pará (10), the agrarian relationships are characterized by a high proportion of large estates. Rich landowners constitute the socially dominant class and overwhelm with their economic influence not only the former slaves, who have no land at all or only small plots, but also the later settlers, who are small landowners of the farmer type. Although in the last few decades capitalistic relationships have begun to penetrate here, it is a region with pronounced survivals of a slaveholding economy, which makes it an area of lingering agrarian crisis. In particular, there are widespread manifest and latent forms of non-economic coercion, repressing the initiative of the rural population and compelling it to work for the fazendeiro landowners, often on shares or for payment in kind. An important role in the formation of the population in the 16th to 18th centuries was played by the importation of African slaves; here are the "blackest" states of Brazil (though owing to long assimilation the proportion of mulattoes among the population is now considerably greater than that of pure Africans).

The natural, particularly the climatic, conditions of this region, especially near the coast, have made it especially suitable for the development of single-crop plantations with sugar cane, cotton, sisal or cacao predominating in different periods. In spite of the fact that the single crops are not identical in different sections of this region (for example, southern Bahia is a distinctive cacao area that has not spread to the rest of the territory), the imprint of the single-crop plantation system lies upon the whole region. Industry has developed only slightly (chiefly the traditional processing of agricultural raw material, such as sugar, sisal, tobacco). Its technical level is low. Survivals of a slaveholding economy make labor especially cheap, and from the viewpoint of capitalist profitability the technical retooling of industry is not justified. On the plantations, the economy is also carried on mainly by manual labor. The living standard of the population is low even by Brazilian standards. There is a systematic outflow of population to the Southeast and South.

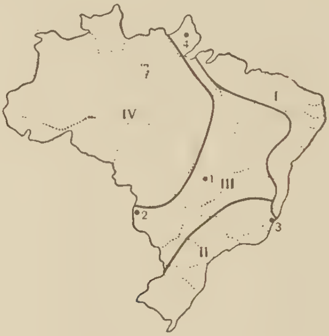


Fig. 3. Fundamental division of Brazil into major economic regions, as proposed by the author

I. Former Slaveholding Northeast
II. Capitalistic South and Southeast
III. Inner Western Colonization Belt
IV. Belt only slightly touched by colonization

1. Location of new capital
2. Corumbá
3. Vitória
4. New manganese mines in Amapá

These characteristics are most typical only in the coastal strip, where the largest part of the population is concentrated. Farther inland semi-arid pasture lands form a sort of second economic tier supplying the coastal plantations with meat and other animal products. Large estates also predominate in this livestock-raising belt; socially, the big livestock owners differ little from the fazendeiro planters. Areas remote from the ocean, especially in the large states of Bahia, Piauí and Maranhão, are almost unpopulated. The caatinga here could be assigned to the area of future colonization, but the margin of more or less developed lands has some traits of the regions now being colonized. The economy here, despite its extensive aspect, is more capitalistic than in the densely populated coastal strip.

Urban life has undergone a moderate development in the Former Slaveholding Northeast. Towns, even the comparatively large ones, are chiefly service centers for the farm areas and engage in transportation and export operations, which often are just as much of the single-commodity type as agriculture is of the single-crop type. The towns of this region show in an especially graphic manner that parasitic functions, rather than productive ones, have been associated with the process of urbanization of Brazil.

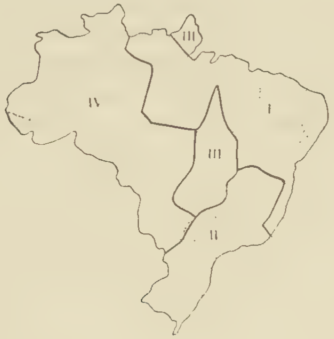


Fig. 4. Division of Brazil into major economic regions according to the principles of Fig. 3, but within the framework of undivided states

I. Former Slaveholding Northeast
II. Capitalistic South and Southeast
III. Inner Western Colonization Belt
IV. Belt only slightly touched by colonization

The second region may conventionally be called the Capitalistic Southeast and South (Rio de Janeiro, São Paulo, Minas Gerais, Paraná, Santa Catarina, Rio Grande do Sul and the Federal District). The economy here is characterized by a much larger proportion of industry; of major importance is the rapid development of mineral resources. In agriculture, farmer-capitalist forms predominate although there are also large landed estates. In a number of localities land reserves suitable for cultivation are nearly exhausted (and those long under cultivation are approaching the end of their fertility) (II). During the last century the region has absorbed considerable contingents from European countries, with only slight participation by the African element in the formation of the population. A substantial role in the development of capitalist relationships has been played by the economic influence of the two cities having populations in the millions -- Rio de Janeiro and São Paulo-- and of a series of port cities that have also become centers of industry (Santos, Niterói, Pôrto Alegre, Paranaguá, Rio Grande and Pelotas). São Paulo together with its environs concentrates about half of the manufacturing industry of Brazil. Both São Paulo and Rio de Janeiro are financial centers, the focal points of banking operations and other forms of movement of capital in the country.

Not all of the territory of these states has the full characteristics of the Capitalistic South and Southeast. Westernmost Paraná, northwestern São Paulo, western and northern Minas Gerais could be assigned to the regions of contemporary colonization, and, in part, even to the regions of virgin lands. But in the summary indices given below we are obliged to operate with statistical data on administrative units taken as a whole.

The Capitalistic Southeast and South, in addition to different degrees of development, also displays substantial differences in economic specialization; however, the differences are less important than the over-all predominance of capitalistic forms in all sectors. Besides the industrial core (southern Minas Gerais, eastern São Paulo and the Federal District), there is a purely agrarian zone (western São Paulo and the states of Paraná, Santa Catarina and Rio Grande do Sul). Within this zone, clearly differentiated areas of predominance of specific crops can in turn be distinguished. The most important of these areas is the coffee plantations of São Paulo; also characteristic is the concentration of almost all the wheat lands (not only of the region in question, but of all Brazil) in Rio Grande do Sul and a part of Santa Catarina.

The climatic conditions are more favorable for the settlement of European immigrants (including those from countries capitalistically more developed than Portugal - Germans, Italians, Poles) who have brought with them their work habits, which are not comparable with those that have prevailed on the slaveholding plantations. An important premise for the more rapid development of capitalist relationships in the South and Southeast was the abundance of minerals in Minas Gerais (iron and manganese, rare metals, etc.) and the presence of coal in the extreme south.

The transfer of the capital of Brazil from Salvador to Rio de Janeiro in 1763 was, as it were, the beginning of the displacement of the economic center of gravity of the country from the old plantation states. The further growth of Rio de Janeiro rested to a large extent not only upon its role as a capital, but also upon the convenient transport connections between Guanabara Bay and the mining centers of Minas Gerais, which fell into the zone of gravitation toward the capital. As regards São Paulo, it grew as a purely capitalistic center (12), with a proportion of the population engaged in industry that was unparalleled in Brazil (13).

The Former Slaveholding Northeast and the Capitalistic Southeast and South, occupying only about one-third of the territory of Brazil, concentrate more than nine-tenths of her population and production.

Following the principle of not breaking up states in regionalization, we were forced to include in the above-described regions those remote parts of the states which, in level of development, should have been assigned to the Inner Western Colonization Belt. The latter would appear in the shape of a strip of varying width bordering the main cores of the two above-described economic regions. Outside of the eleven states of the Former Slaveholding

Northeast taken as a whole, and the 6 states of the Capitalistic Southeast and South, only one state, Goiás, can be assigned to the Inner Western Colonization Belt, and even then not entirely (less its northwestern and western sections), and also the territory of Amapá (14). It is rather difficult to speak of a complete analogy with the Western colonization area of the United States, even before the beginning of the 20th century, because the Brazilian degree of development is considerably lower (although its forms are purely capitalistic), and because the Brazilian zone has no direct outlet to the world trade routes (which in the United States greatly accelerated the economic development of its Pacific coast). Nevertheless, Goiás bears a distinct imprint of current colonization. The railroad in the heart of the state has already been laid as far as Anápolis.

It is significant that the Brazilian government is now building a federal capital in Goiás to speed up the development of lands in the heart of the country and to bring the center of administration nearer to the regions being colonized(15). The plan to transfer the capital from Rio de Janeiro to Goiás is clear evidence that the Brazilians feel the western state is being actively colonized. The state has a high rate of population growth (47 per cent from 1940 to 1950). However, the absolute population increment is still small (less than 400,000).

The fourth basic region of Brazil comprises areas of future development (Amazonas and Mato Grosso and the territories of Rio Branco, Acre and Rondônia). They are still almost entirely unsettled. Moreover, their present population often carries on an extremely primitive economy. A considerable part of this vast area consists of virgin lands, the colonization of which lies in the future (though here too there are separate areas which, in level of development, could be assigned to the Inner Western Colonization Belt). Essential here are the geographic differences between the north (the equatorial and tropical forests) and the southwest (predominance of "cerrados") where development is easier (there are open expanses). For the time being the main economic form is cattle raising, under almost wild conditions. Mato Grosso, with an area equal to two or three of the biggest West European countries, has little more than half a million people; but there are about twelve head of cattle for each inhabitant on the average.

Table I gives a summary of the basic indices for each of the regions in our scheme, showing their differences in the degree of general economic development and in the level of development of capitalism. Comparing the percentage share of the regions in the basic production indices with their share in territory and population, it is easy to see the absolute primacy of the Capitalistic South and Southeast. The concentration of urban population, of industrial workers and of the railroad network is a vivid expression of the higher level of development of capitalism. A comparison of the share of the South and Southeast, on the one hand, and the Northeast, on the other, with respect to the number of workers and industrial production (81.0 and 89.1 per cent compared with 17.4 and 9.7 per cent) reflects the differences in productivity of labor under conditions of developed capitalism and in a region of past slave ownership. The indices of economic development (for example, the proportion of land in agricultural holdings and in cultivation) declines regularly from the first to the last column of the table.

Unfortunately, the state of Brazilian statistics does not permit one to uncover the different degrees of development of capitalist relationships with the aid of the system of indices used by V. I. Lenin for the United States. In giving data on forms of land tenure and distribution of lease relationships, Brazilian statistics make reservations that render them valueless (16). There is no reliable information on sharecropping and so forth. Still, a number of the indices used by Lenin for the United States can also be extracted from the Brazilian statistics, chiefly from the agricultural census of 1950 (though there is not complete confidence in the reliability of the inventory itself). Some of the indices enumerated by us in Table 2 essentially supplement the characterization of individual aspects of the penetration of capitalism into agriculture and the influence of capitalist relationships upon the demographic processes (see Table 2).

The proposed division of Brazil into chief economic regions makes it possible to distinguish subdivisions in each region on the basis of the concrete forms of economic activity, taking into account industrial specialization , crop predominance, etc. In spite of the leading significance of economic features in this stage of regionalization the natural landscapes must also be considered. This is fully understandable because economic specialization (especially in agrarian and mining countries such as Brazil) takes shape under the influence of natural conditions (restricting or favoring specific crops) and resources (17).

It is difficult, in the framework of this article, to justify thoroughly such further subdivisions, which would, of course, have to overlap the boundaries of states. But as a working hypothesis we supply a scheme of possible subregions in Table 3.

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References

1. V. I. Lenin . Soch. 4th ed., Vol. 22.
2. By 1940 the number of industrial workers had reached 781,200; during 1940-1950 it grew by 61 per cent to 1,256,800. (These and other statistics, unless otherwise stated, are taken from Anuário estatístico do Brasil 1955 , I. B. G. E., Rio de Janeiro, 1956) .
3. The total share of foreign capital in Brazilian industry in 1955 exceeded 40 per cent, but since this capital was distributed among key industries and enterprises, its actual role in the economic life of the country was much greater. The lion's share of the investments goes to United States capital. The high profits received in Brazil from earlier investments are to a considerable degree the source of new foreign investments.

. According to data published in the Brazilian journal Conjuntura económica (1956, No. 7) and based on the reports of 5,100 enterprises (apparently the larger ones, with a predominance of higher-paid workers), the average hourly wage was 14.5 cruzeiros (about 20 cents); in industries employing the largest numbers of workers - the textile, food and wood-working industries - the hourly pay was 12 cruzeiros. These figures include also the wages of the foremen, technicians and other highly paid groups. In actual practice workers do not earn the living minimum of 3,000 - 3,500 cruzeiros per month (about forty dollars) officially fixed in Brazil. We had occasion to visit only a few industrial enterprises in Brazil, but we invariably encountered lower figures than those named above. Here are some data gathered on the spot. We were at a big sugar mill where more than 500 workers were employed during the sugar-refining season. With a 12-hour working day, a worker received 5.5 cruzeiros an hour (foremen 8 to 12 cruzeiros). At a big cigar factory, women workers, whose manual skill was truly amazing, received 45 cruzeiros for an 8-hour work day. There were also some simple machines in the factory, but they were little used. At a big enterprise manufacturing mats and other sisal products, a worker received 1,200 cruzeiros a month (it should be stated that all these data refer to industry in the state of Bahia, where wages are especially low). In agriculture, payment in kind is widespread, permitting the landowners to use farm labor under especially advantageous conditions. Wevisted a fazenda near Cruz das Almas.About 40 farm laborers work four days a week for the owner, each receiving 25 cruzeiros a day (a living minimum being 35-40 cruzeiros). On the remaining days of the week the laborer has a chance to cultivate "for himself" a plot of land allotted to him. In addition, the fazendeiro graciously provides him with quarters in a barracks. Who gains from this deal was evident from the opulent home of the fazendeiro, his luxuriant garden and the fine orange groves (30 hectares), tobacco fields (10 hectares), and other valuable crops.

. We must bear in mind that in 1954 the physical volume of coffee exports was two-thirds of that of the preceding years because of the cold wave of 1953, which destroyed over 600 million (one-fifth) of the coffee trees.

. For more details see A. V. Volkov and M. B. Gornung, "Geographic science in Brazil," Izv. AN SSSR, ser. geogr., 1957, No. 1.

. Preston James, Latinskaya Amerika, Russian translation, 1949, Pages 368-497. Since this book is well known to Soviet readers, we do not give James' list of regions here in order to save space.

. V. V. Vol'skiy and A. N. Glinkin, Braziliya, Geografgiz, 1956.

. With some of these reservations we do not agree. The authors write that "the existence of the economic-geographic regions defined presupposes.. ..a close economic interconnection between them. In Brazil the main commodity production of the country is not oriented toward the domestic, but toward the foreign market. Hence ... the individual regions do not cooperate so much with one another as they compete with one another. Under these conditions there can be no question of close economic interconnections....". On this basis the authors declare that "the economic-geographic regions of Brazil have not yet been defined" (p. 66). But, after all, fierce interregional competition is a characteristic of any capitalist country, to whose regions the yardstick of "cooperation" characteristic of our regions cannot be applied. The "extreme economic isolation" of individual parts of Brazil, of which the authors write, does not prevent these parts from (and perhaps helps them in) preserving distinctive economies and thus being regions in the full sense of the word (though, of course, in the capitalist fashion). Moreover, the country is characterized by a rather high degree of marketable production and it makes no difference whether it is oriented toward the foreign or the domestic market; specialization in foreign trade is just as significant as the interregional division of labor. It would seem that Brazil is precisely one of the countries with a clearly pronounced regional structure.

10. The place of Espírito Santo and Pará in the proposed grouping of states seems the most debatable. Both Preston James and the Soviet authors V. V. Vol'skiy and A. I. Glinkin assign Espírito Santo to the Southeast. It would seem, however, that a number of detailed indices, especially for agriculture (this state is almost purely agrarian), such as the value of agricultural enterprises and the share of machines and tools in that value, the structure of outlays in agriculture, and so forth, relate Espírito Santo to the Northeast. The same can also be said of the general "plantation style" of agriculture there. The crop composition is very varied: in addition to coffee, a typical "Paulist" crop, there is also a wide distribution of such characteristically Northeastern crops as sugar cane, cacao, bananas, oranges and even cotton. Espírito Santo conincides with one of the old Capitanias; the development of the economy there was just as sluggish as in the main states of the former slaveholding Northeast. As regards Pará, its most thickly inhabited part (the Belém-Bragança Zone) is similar to the former slaveholding Northeast in the formation of its economy and in its present structure; also essential is the fact that Belém is now linked by railroad with the state of Maranhão. Belém "faces" toward the Amazon only in its waterway connections; its economic peculiarities as a commercial port make it akin to the other ports of the Northeast.

11. The latter circumstance was emphasized, in connection with the difficulties of supplying food to the big cities, in some papers read by Brazilian geographers at the 18th International Geographical Congress.

12. In 1872 only 26,000 persons lived in São Paulo; in 1900, 200,000; in 1953 over two million (P. Monbeig, *La Croissance de la ville São Paulo*, Grenoble, 1953).

13. In 1950, 24.5 per cent of all persons over ten years of age were employed in industry, 23.4 per cent in commerce, credit and insurance operations, in services and in the professions (in both cases in per cent of the total after deduction of the agricultural population ascribed to the municipality of São Paulo). The calculation was made from the *VI Recenseamento geral do Brasil, 1950. Estado de São Paulo. Censo demográfico*, I.B.G.T., 1954.

14. A railroad recently built in Amapá north of the Amazon leads to new manganese mines whose ore is exported through Macapá. The rapid mining development of Amapá, where iron ore has also been discovered, is attracting population.

15. President Kubitschekof Brazil recently declared that he intends to effect the transfer of the capital under his presidency (*Engenharia, mineraçao e metalurgia*, 1957, No. 146). In our opinion, the businessmen of São Paulo, rival

of Rio de Janeiro, are most interested in this project. With the creation of the new capital (at the expense of the Federal budget!) the economic power of São Paulo would enable it to crowd out Rio de Janeiro, whose businessmen would not have the advantages of "intimate" connections with government institutions. The Paulists apparently dream of something like the situation of New York with respect to Washington; Rio de Janeiro in this case would be assigned the role of Philadelphia or Boston.

. Despite these reservations, we note that according to the official statistics twice as much land is being used under lease rights in the Capitalistic South and Southeast as in the Former Slaveholding Northeast.

. For example, from the viewpoint of the extent of farming types in the South, a key role is played by the southern limit of coffee growing, which the Brazilian plant geographers draw through the northern part of Paraná. The combination of soil and climatic conditions was the premise for the rise of a strongly specialized area of cacao cultivation in Bahia.

Table I

Basic indices of the four major economic regions of Brazil

Indices	Capitalistic South and Southeast 1.	Former Slave-holding Northeast 2.	Inner Western Colonization Belt 3.	Belt only slightly touched by colonization 4.	All Brazil 5.
Territory in thousands of sq. kms.	1,451.4	1,582.4	760.2	4,697.6	8,513.8
Per cent of all Brazil	17.2	18.7	8.9	55.2	100.0
Population in thousands (1950)	29,346.8	18,993.7	1,252.4	2,329.4	51,944.4
Per cent of all Brazil	56.6	36.5	2.4	4.5	100:0
Density of population in persons per sq. km. (1950)	20.5	12.0	1.7	0.5	6.1
Urban population in thousands (1950)*	9,431.1	2,923.2	187.5	415.7	12,957.5
Per cent of all Brazil	72.6	22.6	1.5	3.2	100.0
Per cent of the total population	31.1	14.5	14.9	17.8	25.0
Number of industrial workers in thousands (1950)	1,016.7	218.6	3.6	17.8	1,256.8
Per cent of all Brazil	81.0	17.4	0.3	1.3	100.0
Industrial production, in billion cruzeiros (1949)	103.9	11.3	0.5	1.0	116.7
Per cent of all Brazil	89.1	9.7	0.4	0.9	100.0
Area of agricultural holdings, million hectares (1950)	94.4	61.8	25.4	51.8	233.7
Per cent of all Brazil	40.5	26.6	10.8	22.1	100.0
Per cent of the total area	65.1	39.0	33.4	11.0	27.4

* Recognized by the official Brazilian statistics as "urbano."

	1.	2.	3.	4.	5.
Cultivated area (including fallow and idle land), million hectares (1950)	12.5	6.4	0.6	0.6	20.1
Per cent of all Brazil	62.1	32.1	2.9	2.9	100.0
Per cent of area of agricultural holdings	13.2	10.4	2.4	1.2	8.6
Per cent of whole area	8.6	4.0	0.8	0.1	2.4
Value of 14 principal crops in billion cruzeiros (1953)	75.5	21.7	3.0	1.5	101.7
Per cent of all Brazil	74.2	21.3	3.0	1.5	100.0
Cattle, in million head (1953)	33.2	11.7	5.3	7.4	57.6
Per cent of all Brazil	57.7	20.2	9.3	12.7	100.0
Total length of railroads in thousand km. (1954)	26.2	8.5	0.5	2.0	37.2
Per cent of all Brazil	70.5	22.8	1.3	5.4	100.0

Table 2

	Capitalistic South and Southeast 1.	Former Slave-holding Northeast 2.	Inner Western Colonization Belt 3.	Belt only slightly touched by colonization 4.	All Brazil 5.
Demographic indices					
Proportion of immigrants and naturalized persons among population (in per cent)	3.9	0.1	0.3	1.6	2.3
Migration balance in per cent of present population*	+1.7	-5.3	+21.9	+3.7	--
Proportion of illiterates among population (in per cent)	40.0	69.2	66.4	52.6	51.7
Property indices in land tenure					
Proportion of land holdings with an area of over 1,000 hectares (in per cent of total holdings)	36.6	38.8	58.9	88.7	51.1
Same -- with less than 100 hectares	23.2	21.0	5.0	2.9	16.5
Value of agricultural property (including land) per hectare (in cruzeiros)	1,250	493	165	85	665
Whereof: machines and tools	16	4	1	0.75	7.5
Structure of money outlays on farms					
Total outlay per hectare (in cruzeiros)	120	46	12	10	65
Whereof: farm-worker wages	57	27	4	6	33
fertilizer, chemicals	8	2	0.5	0.25	4
rentals**	6	1	1	0.5	3

Footnotes on Page 65

[*] The difference between the natives of a given state who were living in other states at the moment of the census and the natives of other states who were living in that state. The plus sign signifies the predominance of inflow over outflow. V. I. Lenin attached great importance to indices of internal migration (and to the influx of immigrants) as an indirect evidence of the development of capitalism: "For a characterization of the South (of the United States - V. P.) it is necessary to add further that the population is fleeing into other capitalistic regions and towns, as the peasantry in Russia is fleeing from the most backward central agricultural guberniyas, which best preserved the survivals of serfdom, into more capitalistic regions of Russia. The sharecropping region both in America and in Russia is the region of greatest stagnation, humiliation and oppression of the toiling masses. The immigrants in America, who play such an outstanding role in the economy of the county and its whole social life, avoid the South" (Soch., 4th ed., vol. 22, p. 14).

[**] This category of expenditures includes the rental of implements. Despite the unreliability of the census, the figures speak clearly of different degrees of development of the capitalist relationships.

Table 3

I. Capitalistic Southeast and East
  A. Industrial-agrarian subregion of big cities on the tropical coast
    a. Constituent areas: Federal District, Rio de Janeiro and east-coast part of São Paulo (including the Paraíba valley).
    b. Economic and natural characteristics: Special role of two "million cities" in economy. Considerable number of secondary towns, often industrial, developing under conditions of gravitation toward "million cities." Small-scale agriculture with high commodity ratio. Difficulties in connections between coast and hinterland, overcome by building railroads across mountains. Tropical and subtropical climate; moderate season differences.
    c. Leading economic activities (in the order of importance): 1. Manufacturing. 2. Agriculture of suburban type (broad range of crops). 3. Harbor services.
  B. Mining subregion on the Brazilian Plateau
    a. Constituent areas: Minas Gerais.
    b. Economic and natural characteristics: Great wealth of minerals; centers of mining industry and heavy industry.
    c. Leading economic activities (in the order of importance): 1. Mining industry. 2. Agriculture of mixed type (with animal husbandry having big role in west and north); lately, coffee growing has been increasing in the south. 3. Heavy industry developing on basis of mineral resources.

C. Coffee region of western slopes of Serra do Mar

a. Constituent areas: Central and western São Paulo, northern Paraná

b. Economic and natural characteristics: Almost ideal conditions for coffee growing, though dangerous frosts occur now and then. Small and medium-size towns, mainly commercial centers, living from their connections with agriculture. Influx of population continues, including immigrants.

c. Leading economic activities (in order of importance):
1. Coffee growing. 2. Other agricultural crops - food crops, certain cash crops, cotton, sugar cane, fruits. 3. Insignificant industry.

D. Agrarian grain and animal husbandry subregion of extreme South

a. Constituent areas: Southern Paraná, Santa Catarina and Rio Grande do Sul.

b. Economic and natural characteristics: Landscapes transitional to those characteristic of temperate zone; considerable part of territory in virgin condition was occupied by Araucaria forests and humid steppes. Here is wheat belt of Brazil and well developed animal husbandry. Industry only in towns on coast; coal mining and woodworking also important. Population to large extent immigrants.

c. Leading economic activities (in order of importance):
1. Grain economy. 2. Animal husbandry. 3. Manufacturing industry. 4. Coal mining. 5. Forestry.

II. Former Slaveholding Northeast

A. Coastal subregion of plantation economy

a. Constituent areas: Espírito Santo and southernmost Bahia.

b. Economic and natural characteristics: Narrow strip east of mountains; coast has series of lowland sections, partly salinified by sea water (suited for growing coconut palms). Tropical climate. Small-scale plantation economy (coffee can be grown on slopes). Towns and industry poorly developed.

c. Leading economic activities (in the order of importance):
1. Agriculture of mixed type (coffee; commercial growing of fruit trees, including citrus and coconut palms; food crops). 2. Insignificant industry (chiefly in Vitória).

B. Cacao region

a. Constituent areas: South central Bahia, gravitating toward town of Ilhéus

b. Economic and natural characteristics: Smoothly rising relief; "cacao soils" predominate. Intact patches of tropical forest, chiefly on coast; comparatively recent development (forests cleared for plantations). Big landholders economically dominant (though number of small farms is considerable). Industry practically non-existent.

c. Leading economic activities (in order of importance):
1. Cacao monoculture. 2. Animal husbandry (in hinterland).

C. Region of mixed agriculture
  a. Constituent areas: Recôncavo in Bahia and coastal strip north of Recôncavo (Sergipe and Alagoas, coastal parts of Paraíba, Pernambuco, Rio Grande do Norte, Piauí, Maranhão, and western Pará).
  b. Economic and natural characteristics: Strip extending 50 to 200 km. from coast; in west its boundary is marked by sharp increase of aridity. Low mountains (taboleiros or mesas) with fertile soils. Old economic core of Northeast with traditional forms of plantation economy and considerable survivals of slave ownership. Big fazendeiros economically dominant. Industry small, except for Salvador and hinterland; towns mainly commercial centers.
  c. Leading economic activities (in order of importance):
    1. Sugar cane and sugar mills. 2. Food crops. 3. Cotton raising. 4. Fruit orchards. 5. Manufacturing industry (Salvador). 6. Petroleum extraction (Recôncavo).

III. Inner Western Colonization Zone
 A. Pioneer agro-industrial sub-zone
  a. Constituent area: Southern Goiás and sourthern most Mato Grosso.
  b. Economic and natural characteristics: Some arid savannas, used chiefly as pasture lands (big-scale agriculture). Mineral resources (continuation of ore-bearing province of Minas Gerais); manganese, etc. Gravitates toward São Paulo-Goiás and São Paulo-Corumbá railroads.
  c. Leading economic activities (in order of importance):
    1. Animal husbandry. 2. Mining industry (isolated areas).
    3. Pioneer agriculture of mixed type.
 B. Livestock-raising hinterland and caatinga of Northeast
  a. Constituent areas: Inner parts of Northeast, except Sergipe and Alagoas and San Francisco River valley in Bahia.
  b. Economic and natural characteristics: Thinly populated arid plateau, passing over into caatinga. Poor pastures; at places (in depressions, along rivers), spots of feeble agriculture. Typical sertão. Irrigation an important problem.
  c. Leading economic activities (in order of importance)
    1. Animal husbandry. 2. Gathering of carnauba wax. 3. Sisal.
    4. Isolated areas planted to food crops.
 C. Subregion of recent development in San Francisco River Valley
  a. Constituent areas: Western Bahia
  b. Economic and natural characteristics: Attempts to develop more humid riverside part. Colonies created with government aid have big role.
  c. Leading economic activities (in order of importance):
    1. Animal husbandry 2. Agriculture of mixed type.
 D. Subregion of new mine development in Amapá
  a. Constituent area: Territory of Amapá
  b. Economic and natural characteristics: Equatorial forests. Ore wealth (manganese and iron ores) has begun to be exploited.
  c. Leading economic activities (in order of importance):
    1. Mining of manganese 2. Subsistence "forest" agriculture.

IV. Belt only slightly touched by colonization

A. Equatorial forests of North and Northwest

a. Constituent areas: Amazonas and eastern Pará; territories of Rio Branco, Acre and Rondônia: northern Mato Grosso

b. Economic and natural characteristics: Equatorial and tropical forests. Economic lifeline is the Amazon River, to which commerce and numerous towns and cities are tied. In back country, small areas of farming and animal husbandry, hunting and rubber gathering. Part of territory is inhabited only by Indian tribes; total population and degree of development very slight.

c. Leading economic activities (in order of importance): 1. Export of rubber, products of hunting and collecting of various wild fruits. 2. Small-scale, backward farming and animal husbandry. In the future, petroleum extraction may occupy first place.

B. Livestock-raising "cerrados".

a. Constituent area: Central Mato Grosso

b. Economic and natural characteristics: Somewhat arid savanna, slightly used as pasture land and hunting grounds. Sparse population, including backward tribes.

c. Leading economic activities (in order of importance) 1. Animal husbandry (half-wild cattle). 2. Hunting. 3. Primitive farming.

THE MAP OF THE FORESTS OF THE USSR

Reviewed by A. V. Sokolov

(From Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1958, No. 2, Pages 144 - 145).

The Map of the Forests of the USSR at a scale of 1:2,500,000 was published in 1956. Much effort was expended upon its compilation. The effort was all the more considerable because the authors on starting the project had no finished methodology for compiling such a map. The work started with preliminary sketch maps of the forest regions of the Soviet Union, designed to clarify the basic questions of a program for the forest map and the possible degree of detail in the representation of forests and other geographic elements. This part of the work was performed by the Office of Forest Cartography of the former Ministry of Forestry under the direction of P. I. Malev.

As a result of the experimental work, the scales and size of the map were determined. It was to consist of 32 sheets, which when assembled were 3.5 meters high, not counting the margins. The scale and size of the map adopted were optimal. A larger scale would have deprived the map of a very important quality — an ability to present the forest of the USSR at a glance — for it could not have been hung on the wall of most offices. A smaller scale, on the other hand, would have made it difficult to represent the forest areas of the forest-steppes and of the suburban zone of the big cities, especially in the European part of the USSR. These areas, though small, are significant for forestry, water conservation and public health and recreation.

The forest map was compiled under the direction of P. I. Malev by A. F Kruchinin, Engineers O. S. Vorovenkova and B. S. Krotkov and other cartographers, in consultation with M. A. Tsvetkov, senior scientific staff member of the Forest Institute of the Academy of Sciences of the USSR. The printer's copy was drafted and prepared for the press at the Minsk, Tashkent and Tbilisi Map Factories under the general editorship and direction of F.M. Kozlov and V. P. Tseplyayev.

The Map of the Forests of the USSR had no predecessor that the compilers could have imitated in its entirety. The maps published in 1859 and 1900 showed the distribution only of the forests of European Russia, and not even fully because only state forests were included. Privately owned forests were not shown on these maps. After the October Revolution, from 1917 to 1931, nine forest maps appeared. Two of them covered the forests of Siberia and the others the European part of the country. But they cannot pretend to scientific objectivity and completeness because the forests of the USSR had not been fully studied before the beginning of the 1930's.

The study of the geography of the forest resources throughout the USSR was not completed until 1956. By that time extensive cartographic material had been accumulated, mainly as a result of aerial photo and valuation surveys. However, this material was not uniform in scale(ranging from 1:25,000 to 1:500,000), in origin or in the forest area covered. The Map of the Forests of the USSR was therefore compiled on the basis of lumber district maps, which gave the most complete picture of forest distribution and of reforestation plans. But in trying to convey the actual extent of the forest land in the Soviet Union with maximum completeness and accuracy, the compilers did not confine themselves to cartographic sources, but drew also on extensive statistical material on forest inventory and consultations with specialists.

If the compilers had followed the usual procedures of generalization, they would not have attained the best approximation to objective reality in the portrayal of the distribution of the forests, and many features that are small but valuable for the geography of forests of the USSR would have been omitted. They included a large part of the forest-steppe and steppe zones consisting of forests of small areal extent, as well as clearings in the tayga. In other words, the slightly forested forest-steppes would have appeared still poorer in forests on the map, and the heavily forested tayga would have been given an exaggerated amount of forested area.

The compilers followed a different course: On the basis of their cartographic, statistical and research materials they tried to portray on the map with maximum completeness and accuracy the present extent of the woodland of the oblasts, krays, republics, and all the geographic zones of the Soviet Union.

The many years of persistent labor have justified themselves. A Map of the Forests of the USSR has been produced, showing with maximum completeness the composition and distribution of the forests of our country.

The map shows the areas occupied by forests and distinguishes the dominant tree species: pine, fir, spruce, fir with spruce, larch, Siberian stone pine, Japanese stone pine, oak, linden, birch, aspen, beech, hornbeam, beech with hornbeam, other broadleaf trees, juniper, saksaul, a total of seventeen dominant species. In addition, the map shows thin spots, burned-over spots, deadwood spots, sands, swamps, rock slides, as well as logging and navigable rivers, railroads and highways.

The map shows the distribution of the commercial stands of the predominant tree species for each of the economic administrative regions of the Soviet Union. It shows, for example, that the most widely distributed species in our country is the larch, but that its largest stands are found in the eastern regions poorly served by transportation and remote from market areas for this wood. In second place is the pine, whose main areas are not all equally accessible to markets. The pine of the Urals and the European North has good connections with the timber-deficit regions of the Center, the Donets Basin, the Ukrainian SSR, the Volga and the North Caucasus through rivers and railroads, but the pine areas of Siberia, especially Eastern Siberia, are poorly served by the transportation net and are remote from markets.

The map shows that the degree of forest cover varies according to geographic zones, population density, the saturation of the territory with industrial enterprises, the density of the transportation network and other factors. Thus, though natural conditions favor forest growth in the oblasts of the Center of the RSFSR, the forests there consist of small, widely dispersed stands. This is especially evident as one goes southward along the upper Volga. A similar forest distribution is associated with the regions around Leningrad, Gor'kiy, Perm' and other large industrial and transportation centers, including even some in the forest-surplus regions.

The Map of the Forests of the USSR will undoubtedly have wide practical uses. It makes it possible to check the general statements often found in the literature about the forest resources of a given region. This is true, for example, of the forest resources of the region where the Bratsk hydroelectric station is being built. The literature (Great Soviet Encyclopedia, 2nd edition, vol. 18, pages 443-444) makes statements to the effect that Irkutsk Oblast "includes spruce and Siberian stone pine tayga in the watershed between the Angara and the Lena" and "pine predominates in the southern tayga between the Angara River and the Sayan Mountains." The same article says:" Coniferous species predominate: Siberian larch (39 per cent of the total forest area), pine (29 per cent), Siberian stone pine (9 per cent), fir (8 per cent) and spruce (about 1 per cent). Among the broadleaf species, the most widespread is the birch (up to 8 per cent).

The Map of the Forests of the USSR reveals a different picture. It shows that the Angara flows almost to the village of Kezhma in a 2.5 -to-5-km.-wide strip poor in forest. From Zayarsk to the Padun Rapids (the site of the Bratsk project) large pine areas reach the Angara along both banks. These pine areas are interrupted along the right bank of the Angara, above the village of Kezhma, by a large area with a predominance of birch. South of Kezhma, 15 to 20 km. from the Angara, on the left bank of the Kezhma-Naratayskaya River, is a large area of birch, and along the Chama River a large area of birch with aspen stands out amid the pine. As the Bratsk Reservoir fills up, these broadleaf areas extending 30 km. upstream from the mouths of the Kezhma-Naratayskaya and Chama Rivers, will become accessible for cutting and the timber can be floated down into the Angara.

South of Zayarsk pine predominates west and east of the Angara. In scattered spots there is a predominance of birch, birch with aspen, fir with spruce, or larch, while Siberian stone pine is found only in rare patches. Particularly southeast of Zayarsk and south of the Lena Railroad, along the right bank of the Angara, the forest-steppe river side zone is adjoined by a 2.5- to 7 km.- wide birch area that passes toward the east into an area with a predominance of aspen. Along the left bank of the Angara between Verkhneye Suvorovo and Rasputino, a considerable area among the pine forests is occupied by broadleaf stands, chiefly birch, with patches of fir with spruce, burned-over spots and deadwood spots.

Similarly detailed treatment is given to the areas and the composition of the forests in the basins of the Oka and the Iya, tributaries of the Angara that will be affected by the filling of the Bratsk reservoir.

The map has been well received by geographers, forestry specialists and cartographers. In particular, it was highly praised at a joint meeting of the Council of the Forest Institute of the Academy of Sciences of the USSR, the Moscow branch of the Geographical Society of the USSR and the Moscow Society of Students of Nature.

NEWS NOTES

By Theodore Shabad

In recent months the Soviet press published reports on the fulfillment of the 1959 economic plan and on the plan for 1960. The reports contain the following data of interest to geographers.

Iron and steel. Iron and steel production increased by an average 9 per cent in 1959 and a similar rate of growth was envisaged for 1960. The most rapid expansion of production took place in steel pipe, which increased by 13 per cent in 1959 and is scheduled to rise by 12 per cent in 1960. Steel-pipe production is being given high priority because of the Soviet Union large program of oil and gas pipeline construction. The following table gives the key production figures of the iron and steel industry (in million metric tons

	1958	1959	1960 Plan
Pig iron	39.6	43	47
Crude steel	54.9	59.9	65
Rolled steel	42.9	47	50
Steel pipe	4.6	5.2	5.8
Coke	50.9	53.4	no data
Iron ore	88.8	94.4	105

The economic reports stress the existence of a shortage of iron ore and urge speedier construction of new iron mines at Korshunovskoye in Irkutsk Oblast, Teya in Krasnoyarsk Kray and Kachkanar in Sverdlovsk Oblast, as well as in the area of the Kursk Magnetic Anomaly. That area, which had only one experimental mine two years ago, has become the scene of major mining development projects. During 1959-60 total annual capacity of 7.7 million tons of iron ore is to be put into operation at the Yuzhno-Korobki, Lebedi and Mikhaylovka mines. This would provide a local ore supply for the iron and steel plants of central European Russia, notably the expanding plant at Lipetsk, and gradually eliminate long ore hauls from Krivoi Rog and elsewhere. In addition to Lipetsk, new capacity is to be installed in 1960 at the steel plants of Magnitogorsk, Chelyabinsk, Novotroitsk (Orenburg Oblast), Nizhniy Tagil and Cherepovets, while construction is expected to continue on the new West Siberian steel plant at Stalinsk in the Kuznetsk Bas

Fuels. Natural gas and petroleum production is advancing at a rapid rate while coal output is being held back. In 1959 the production of natural gas increased by 25 per cent and petroleum by 14 per cent compared with only a 2-per-cent rise in coal output. The principal production figures follow (in million metric tons, except for gas, which is in billion cubic meters):

	1958	1959	1960 Plan
Petroleum	113.2	129.5	144
Natural gas	29.9	37.2	53
Coal	495.8	506.5	515
Oil shale	13.2	13.7	no data

More than 2,000 kilometers of gas pipelines were placed into operation in 1959, including the pipelines Serpukhov-Leningrad, Stavropol'-Groznyy, and Shebelinka-Belgorod-Bryansk. In addition about 2,000 kilometers of crude-oil and refined-products lines were built. Oil-refining capacity was expanded at Kstovo (near Gor'kiy), at Omsk and in the Bashkir ASSR. The new Ryazan' refinery is scheduled to open in 1960.

Almost 90 per cent of all Soviet petroleum is now produced in the Russian Federated Republic, particularly in the Volga-Urals area. Crude-oil production in the RSFSR increased from 88 million tons in 1958 to 103 million in 1959; the 1960 goal is 116 million tons. Similarly, natural gas production in the RSFSR is rapidly growing through the development of the gas fields near Stavropol' and Krasnodar in the Northern Caucasus. RSFSR gas output rose from 15 billion cubic meters in 1958 to 19.8 billion in 1959; the 1960 goal is almost 30 billion cubic meters.

In oil refining, Diesel fuel output is expected to increase by 15 per cent in 1960 compared with an over-all planned increase of 9.3 per cent for all motor fuels. The use of Diesel fuel is being heavily promoted both in agriculture and on the railroads.

Coal production is expected to increase mainly through an expansion of coking coal and of the cheap surface steam coals used to fuel large thermal power plants in Siberia.

Electric power. Soviet electric power generation increased from 233 billion kilowatt-hours in 1958 to 264 billion in 1959; the 1960 goal is 291 billion kilowatt-hours.

By the end of 1959 twelve of the twenty-four turbines of the Stalingrad hydroelectric station on the Volga had been installed, giving the station a generating capacity of 1,380,000 kilowatts. The Stalingrad power plant was linked by a 500,000 volt transmission line with Moscow through Voronezh, Lipetsk and Ryazan' oblasts.

According to present plans the Stalingrad station will be brought to its full capacity of 2,563,000 kilowatts in 1960, making it the largest hydroelectric plant in the world. Also slated for complete installation are all the turbines of the 625,000-kilowatt hydroelectric station on the Dnieper at Kremenchug, where four out of twelve turbines were operating at the end of 1959. The Kremenchug station is the third power plant on the Dnieper River. The others are the stations at Zaporozh'ye (650,000 kilowatts) and Novaya Kakhovka (312,000 kilowatts). In 1960 work is also expected to continue at a rapid rate on the Bratsk hydroelectric station on the Angara River in Siberia, where the first turbines are now scheduled to start producing power in 1961. The designed capacity of the Bratsk station is 4,500,000 kilowatts.

Chemicals. The accent continues to be on synthetics and plastics. The production of man-made fibers increased from 166,600 metric tons in 1958 to 179,000 in 1959; a further 17 per cent to 209,000 tons is planned for 1960. The production of plastics is scheduled to increase by 20 per cent in 1960. Synthetic-rubber production is shifting increasingly from industrial alcohol based on potatoes and grain to synthetic alcohol or directly to oil-refinery waste-gas utilization. New synthetic rubber plants utilizing refinery gases are scheduled to start operations in 1960 at Sterlitamak (Bashkir ASSR), Stavropol' (Kuybyshev Oblast) and Omsk. Other large chemical plants due for 1960 are a staple-fiber factory at Ryazan' and synthetic-fiber factories at Kursk and Cherkassy. The tire factory at Dnepropetrovsk, being built with British assistance, is also planned to open in 1960.

Regional developments.

Ukraine. The large Zmiyev thermal power station near Khar'kov is to start operations in 1960. Expansions are scheduled in the production capacity of the textile, leather, sugar, meat-packing and dairy industries. The first section of the Kiev subway is planned to open in 1960.

Belorussia. The principal projects on which work is continuing are the Polotsk oil refinery, which will receive crude by pipeline from the Kuybyshev oil fields, and the Starobin potash plant.

Uzbekistan. Natural gas production at the Bukhara fields is expected to expand considerably in 1960 when the gas pipeline from Bukhara reaches the Tashkent industrial area. Work is continuing on a large nitrate fertilizer plant at Fergana.

Kazakhstan. The new Karaganda iron and steel plant is scheduled to produce its first pig iron and coke in 1960. Two 150,000-kilowatt turbines are to be installed at the Bukhtarma hydroelectric station on the upper Irtysh River. Work is continuing on the Sokolovka-Sarbay iron-mining center at Rudnyy (Kustanay Oblast), a growing source of iron ore for the Urals steel industry; on the Dzhezkazgan copper smelter, the Pavlodar aluminum plant and the Dzhetygara asbestos mine. The Temir-Tau synthetic rubber plant is expected to produce its first rubber in 1960, using the limestone-calcium carbide —acetylene system as its raw material base.

Turkmenia. Construction of the first section of the Karakum Canal, from the Amu Darya to the Murgab oasis at Mary, will be completed in 1960, and work will be started on the canal's second section, from the Murgab oasis to Tedzhen.

Azerbaydzhan. Natural gas production in the Karadag field near Baku is expected to reach 6.2 billion cubic meters in 1960, of which 10 per cent will be sent by pipeline to neighboring Georgia and Armenia. In addition Azerbaydzhan will be supplying one billion kilowatt-hours of electricity to these two republics. Work is continuing in Azerbaydzhan on the Kirovabad alumina plant, which will be using near-by alunite resources.

Georgia. Construction of a 600,000-kilowatt thermal power station is to be started in the Tbilisi area, using natural gas from Karadag as fuel. Manganese production is to be expanded at Chiatura. About 1,900 hectares of tea fields and 4,000 hectares of vineyards are to be planted in 1960.

Armenia. Work is continuing on the Yerevan hydroelectric station, the last of the series of power plants on the Razdan (Sevan) River, and on the Agarak and Kadzharan copper and molybdenum mines.

Estonia. The installation of additional generating capacity in the Baltic shale –fueled power station near Narva, completed in 1959 , will increase Estonian power generation by two-thirds. This increase will meet Estonia's power requirements and leave a surplus of 650 million kilowatt-hours for transmission to neighboring republics.

Agriculture. The total area under crops in 1959 was 196.3 million hectares, an increase of 0.7 million hectares over 1958 and of almost 40 million hectares over 1953. The increase was achieved mainly through the development of the virgin and idle lands of Western Siberia and Northern Kazakhstan. The promotion of corn growing in recent years is evident from the expansion of the corn area to 22.4 million hectares in 1959, or 19 million over the 1953 level.

Because of a drought in several farm regions, the 1959 harvests of grain, sugar beets, sunflowers and fiber flax were below the 1958 level.

The total grain crop was 124.8 million metric tons in 1959 compared with 141.2 million in 1958. The 1960 goal is set at 152.7 million tons.

The cotton crop (unginned) was 4.7 million metric tons in 1959, the highest ever obtained in the Soviet Union. The 1958 crop was 4.4 million tons. The principal increases were achieved in the Uzbek SSR, main cotton producer, the Tadzhik SSR, South Kazakhstan Oblast and Chardzhou Oblast.

The sugar-beet crop was 43.9 million metric tons in 1959 compared with 54.4 million in 1958.

Further advances were made in 1959 in the production of animal products which is receiving the highest priority under the current Soviet farm program. Meat output in 1959 was 8.6 million metric tons (slaughter weight), of which 4.2 million was produced in meat-packing plants and 4.4 million on collective farms and in households. Total meat production was 7.7 million tons in 1958 and is planned to reach 10.6 million tons in 1960. Milk production increased from 58.7 million metric tons in 1958 to 62 million tons in 1959; the 1960 goal is almost 72 million tons. Butter production in 1959 was 845,000 metric tons, of which 712,000 was produced in creameries and 133,000 on collective farms and in households. Wool production rose from 322,000 metric tons in 1958 to 350,000 in 1959.

Livestock holdings continued to increase, as follows (in million head:) cattle from 70.8 at the end of 1958 to 74.1 at the end of 1959, of which cows from 33.3 to 33.9; hogs from 48.7 to 53.3; and sheep from 129.9 to 136.1. A large share of the livestock continues to be privately owned, ranging from 50 per cent of all cows to about 25 per cent of the sheep.

Railroads. The railroads continued to handle almost 90 per cent of all freight traffic in 1959, accounting for 1,429 billion metric ton-kilometers. Total railroad loadings in 1959 were 1,750 million metric tons. Conversion of the Soviet railroad system to Diesel and electric traction is being speeded. By the end of 1959, more than 25,000 kilometers of railroads were served by Diesel and electric engines. By the end of 1960 that part of the system is planned to reach 34,000 kilometers. As a result of the expansion of Dies and electric traction, the share of the total freight traffic handled by that part of the railroad system rose from 26.5 per cent in 1958 to 33.5 per cent in 1959. By the end of 1960 it is planned to be 41 per cent. The conversion in 1960 alone is expected to reduce coal consumption on the railroads by almost 13 million metric tons compared with 1959. In 1960 a total of 2,140 kilometers of line are to be added to the electrified railroads. Electrification the Trans-Siberian Railroad from Moscow to Irkutsk is expected to be complet

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Sugar beets in the Northern Caucasus. Sugar beet plantings have almost tripled in the Kuban' lowland in the last three years and amounted to 170,000 hectares in 1959. Plans are for increasing the area to 260,000 hectares in 1960 and to 400,000 hectares by the end of the seven-year plan in 1965. Within the last year and a half, ten new sugar-beet factories have been built in the Kuban', each with a daily capacity of 2,500 metric tons of beets. Afte the completion of three more such factories in February and March, and countin two older factories that existed before the present expansion, the Kuban' will have a daily beet-processing capacity of 37,000 tons for the 1960 season.

Oblast changes in the Uzbek SSR. Two oblasts were abolished in January 1960, in the Uzbek SSR. They are Kashka-Dar'ya Oblast, which was merge with Surkhan-Dar'ya Oblast, and Namangan Oblast, which was merged with An and Fergana Oblasts in the Fergana Valley.

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